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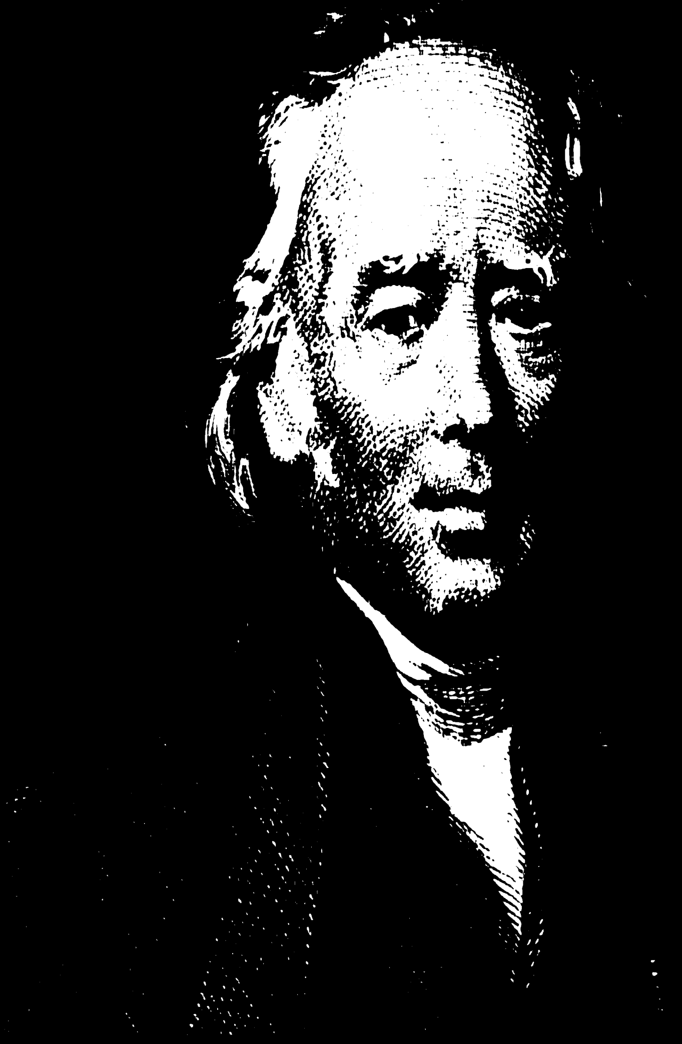

Pharmaceutical journal

Pharmaceutical Society of Great Britain

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THE PRESENT INTRICATE STATE OF THE MEDICAL REFORM QUESTION.

The events of the past month have shown how necessary it is for all parties directly or indirectly concerned in the Medical Bill, to watch its progress in Parliament. It had been generally understood, not only that allusion to Pharmacy had been purposely avoided, but that the Bill was not intended to interfere in any way with Chemists and Druggists; but at the last moment, when the apprehensions of our body were dormant, a clause was introduced which gave altogether a new character to the Bill. We cannot believe that it ever was the intention of the Government to place upon the Chemists the restrictions which would have been inflicted by clause 36 D; and we give Mr. Upton credit for sincerity in the opinion which he expressed on the subject, namely, that the said clause would not interfere with the province of the Dispensing Chemist*. It is clear, however, that it admitted of a construction which was not intended, and that if there had not existed a standing Committee, whose duty it was to watch over the interests of our body, the fact might have escaped observation. The prompt and decisive measures which were proposed, and the unanimity which prevailed in their adoption, have produced the desired result, and, for the present, our labours are suspended. We must not, however, consider the task is accomplished, or the necessity for vigilance superseded, until the laws for regulating the Medical Profession, including Pharmacy, are finally adjusted.

The only circumstance to be regretted in the late movement in our body, was the necessity of appearing to oppose the Government Bill, and thus to add to the difficulty already attending the undertaking. But it is easy to show that, in reality, this was not the case. On the 25th of February, Sir James Graham's amended Bill was laid before the House of Commons, and its further consideration was postponed, in order to allow the profession time to consider its provisions. At the suggestion and request of some of the parties concerned, additional clauses were introduced, which were calculated to operate injuriously on other parties. A respectful remonstrance against this contemplated injury cannot justly be considered an opposition to the Bill, since it was designed rather to restore it to the state in which Sir James Graham had previously laid it before the House. We hope our brethren will continue to maintain that unity which at present exists among them, and to abstain from any collision or controversy with other bodies. If our province should be invaded, we must defend ourselves: and experience has shown that a temperate and dispassionate expression of unanimous opinion is more efficacious than turbulent political agitation.

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* See page 14.

If each branch of the profession would take a broad view of the subject, and ask for no more privileges than may be found consistent with the public welfare, the chief difficulty of legislating would be removed, and the interests of all parties might be protected. Sir James Graham has used his utmost endeavours to do justice to the whole profession, and has considerately weighed the suggestions which have been offered on all sides. If the result should not be satisfactory, the responsibility will rest on the profession itself.

It is impossible, by Act of Parliament, to give all Practitioners equal rank and equal privileges. There is a demand for expensive as well as cheap practitioners, and while the qualifications of the latter should be such as to entitle them to public confidence, the mental acquirements of the former should be in accordance with the demand; and these will be proportionate with the amount of preliminary education, and the time devoted to professional studies. The rank of each class has reference to the amount of education. The Physician and the pure Surgeon pursue the study of their profession until the age of twenty-six, and consequently enjoy a higher rank than the Apothecary, who may receive his diploma at twenty-two. The Chemist (according to law) enjoys no rank at all, because he is not (by law) obliged to undergo any education.

There is one period at which all Practitioners are on an equality; namely, at the commencement of their career as students. The same field is open to all. Some devote their whole energies to the study of their profession; others spend more or less of their time in idleness and dissipation. Some have pecuniary resources which enable them to prosecute their studies until they have attained the highest rank; others find it expedient to embark in practice at the earliest period allowed by law. If those who have neglected the opportunity of improvement, or those who have availed themselves of the option of commencing practice with the minimum qualification, should claim to be placed by Act of Parliament on an equality with others whose education has been more elaborate and expensive, this claim might be considered unreasonable; but it is only fair that practitioners of equal merit should enjoy an equal share of distinction and professional rank, and no unnecessary obstacles should exist to the advancement from one grade to another, according to merit.

This was one of the features of Sir James Graham's Bill of February the 25th. Certain classes of Practitioners were recognised and represented; a position was given to each according to the extent of qualification, and a penalty was proposed for the fraudulent assumption of any rank or title.

If all parties had been satisfied with their respective positions, and the amount of protection afforded, no difficulty would have existed; but the collision of interests, real or imaginary, and the struggle for power and precedence between the parties concerned, have given rise to the state of confusion in which the question is now involved.

We have already had occasion to notice the prevailing error of expecting too much from legislation. All that the law can do, consistently with the welfare of the public, is to lay down general principles of education and classification in the profession, protecting the public against the impositions of ignorant pretenders, and conferring certain privileges on qualified men. A complicated system of prohibitions and penalties in the profession itself is nothing more or less than the creation of a number of monopolies, each of which tends to diminish the general usefulness and respectability of the whole profession.

The safety of the public demands that all those who are recognised by law as qualified practitioners, should be educated up to a certain point in all branches of the profession. It is also expedient that each branch should be separately cultivated, as this division of labour promotes the advancement of knowledge, besides furnishing the public with men of the highest talent in their respective departments. The general qualification having been attained, circumstances or mental constitution will be the best guide for each practitioner in deciding to which particular branch he will devote his especial attention, and this decision may take place either at the commencement of his education, or at any subsequent period. It is desirable that each body should preserve its own identity, by adhering, in its official capacity, to its particular province; but the practice of Medicine and Surgery are so intimately connected, that it is impossible by law to effect an *absolute* separation in the case of the several practitioners individually. The same observation applies to the separation of Pharmacy from Medical Practice, which arrangement is highly desirable, although it would be impossible to enforce a rigid compliance with the system in every case. We contend, therefore, that for one class of qualified practitioners to seek protection by penalties against the encroachment of another class likewise qualified, is unprofessional; and that penalties should only be resorted to for the general protection of the profession and the public against impostors.

The chief obstacle to the passing of the Medical Bill at the stage before alluded to, was the opposition of the General Practitioners; and we regret to observe that the remedy proposed by that body is one which is less likely to give ultimate satisfaction than the original Bill. The "grievances" which led to the opposition were, first, that the General Practitioners were not placed on an equality with the Physicians and Surgeons; secondly, only a portion of their number were admitted as Fellows of the College of Surgeons; thirdly, in the selection of the Fellows, the claim of seniority had been in many cases overlooked, and the practice of Pharmacy had been considered a disqualification; fourthly, only the Fellows have the privilege of voting for Members of Council. We think those who have laid so much stress on these grievances have mistaken the shadow for the substance. However desirable rank and representation may be, the real object to which the majority aspire is PRACTICE. Whether an Apothecary would derive any real benefit from the kind of *status* which is claimed by the body—how many additional patients he would gain by stating that he was no longer a Member, but a Fellow of the College—to what extent his practice would be increased by the privilege of voting for Members of Council—these are questions which the parties concerned would do well to consider.

The Council of the College of Surgeons have evidently forgotten the fable of the oak and the bulrush; at the same time we think the General Practitioners have found a "mare's nest."

On taking an impartial view of the intricate state of the medical controversy at the present time, it is obvious that no satisfactory arrangement can be expected, unless some concessions be made on both sides. If a disposition of this kind should manifest itself, the chief difficulty would be removed.

The Medical Bill of February 25th might be made the basis of the new enactment, with a few modifications; such, for instance, as the proper representation of the General Practitioners in the Council of Health, as well as the representation of the University of London, which was overlooked in the first Bill. If the Council of the College of Surgeons would admit to the fellowship, the

Committee of the National Association of General Practitioners, with a certain number of other Members of the Association, to be nominated according to their standing in the profession, this would be the first step towards a mutual reconciliation. It should be a condition that all those who are admitted as Fellows should cease to keep open shops, and the regulations respecting future practitioners might be in accordance with the present views of the College. This plan would have one important advantage: it would establish an inducement to separate Pharmacy from Medical Practice. The desire to become Fellows would encourage medical men to "cut the shop"—to discontinue the sale of jalap and rhubarb, horse-medicines, perfumery, &c. &c., and to adhere more strictly to their own legitimate functions. By this means the competition between the Apothecaries and Chemists would gradually subside, and a feeling of mutual confidence might be established, which would tend materially to diminish the prevalence of "counter-practice." As long as any jealousy exists between the Apothecary and the Chemist, the latter is obliged in self-defence to give advice in cases in which he would gladly refer the patient to a medical man; but he dare not send patients to the Apothecary, who keeps a shop in every respect like his own—he might in this way transfer his whole business to his neighbour. This is not a theoretical view of the case. We speak from actual experience in stating that it is a great advantage to a Chemist to be on good terms with the Apothecaries in his neighbourhood, especially if they adopt the practice of writing prescriptions, a plan which experience has shown to be mutually beneficial in those localities in which it has been tried.

The regulation which we suggest, in reference to the Fellowship, would promote this amicable arrangement between the two classes, and would be attended with public benefit, besides removing the source of jealousy which at present exists. The change would be gradual and voluntary on both sides, and this method of reform is much more desirable than a system of restrictions and penalties, which foster unpleasant feelings between the parties, and which may be constantly evaded, giving rise to frequent litigation. If the Medical Bill were to be adopted in the form above described, no individual in the profession would have any cause to complain—the rank of each would be in proportion to his merit, and if he aspired to a higher grade no obstacle would exist, provided he could prove himself worthy of promotion.

Instead of a College of General Practitioners being created, which would perpetuate the confusion, and raise fresh obstacles to the separation of Pharmacy from Medical Practice, the bulk of the profession would belong to the College of Surgeons, either as Fellows or Members, according to the option of each individual in reference to the prescribed conditions.

Considerable tact is necessary in completing the details respecting education and examination, so as to avoid a collision of interest between the several schools, and to keep each branch of the profession in its proper place. The plan of consulting each party separately has failed, and is not at all likely to succeed, because whatever measure may be approved by the first party, will, of course, be crippled by the second, and the result will be cut to pieces by the third. Each party having taken out a slice and put in a slice, the compound is a wreck of patchwork alike unpalatable to all.

We think this inconvenience might be avoided by the appointment of a *small* committee, consisting of the representatives of the several grand divisions of the profession, who might be brought face to face before a Committee of the House of Commons conversant with the subject of Medical Reform, and competent to weigh the respective arguments and prejudices in the balance.

By the method above described, coupled with a disposition on all sides to discuss the question rationally and dispassionately (an experiment hitherto untried), the disputes among medical men might easily be settled. The supplementary Bill for the regulation of Pharmacy would be attended with little or no difficulty. This Bill should constitute Pharmaceutical Chemists as an educated body, which should also be represented in the Council of Health. The machinery of the PHARMACEUTICAL SOCIETY, which is already in active operation, would require but little modification to adapt it to the general purposes of an Act of Parliament, which has from the commencement been kept in view as the ultimate object of the Society. The management of the body being vested in its own Council, annually elected by the Members at large, and under the superior control of the Council of Health, the examinations and other proceedings would be conducted according to the principles established in the other branches of the profession; and similar penalties should be instituted for the fraudulent assumption of any name or title, implying that the party is qualified under the Act. The education of the Chemist being regulated by a competent Board, under an Act of Parliament, his duties would be more clearly defined than they have hitherto been, and it would be the duty of the Board to ensure the competence of all candidates for whatever functions they might be called upon to perform. It would be particularly desirable to avoid the error of conferring on Chemists a Medical qualification, and thus producing a repetition of the difficulties which arose in the case of the Apothecaries, who by this means have been displaced from their original position. At the same time, the education of the Chemist must comprise a knowledge of the properties and doses of medicines, the usual mode of combination and administration, the antidotes for poisons, with a sufficient amount of therapeutics to qualify him to answer the ordinary questions of patients in reference to the preparations of the Pharmacopœia. It would be impossible as well as impolitic to prohibit altogether the sale of drugs by unqualified persons; but in the same manner as a Chemist would be liable to a penalty for pretending to be a Medical Practitioner—an unqualified tradesman should be liable to a penalty for pretending to be a Chemist. If the public prefer the advice of a quack, or the drugs of a grocer or farrier, no law will prevent the exercise of this propensity; but every person who applies for such advice, or such drugs, ought to be fully aware that the party is not qualified.

PROCEEDINGS OF THE PHARMACEUTICAL SOCIETY, IN REFERENCE TO THE MEDICAL BILL.

A NUMEROUS meeting of the Chemists and Druggists of London and its vicinity was held at the Crown and Anchor Tavern, Strand, on Monday, the 2d of June; Mr. MORSON, Vice-President of the PHARMACEUTICAL SOCIETY, in the chair.

The CHAIRMAN stated, that the Meeting had been called by the Council of the PHARMACEUTICAL SOCIETY, in consequence of the introduction of a clause into the Medical Bill now before Parliament, which, if passed into law, would seriously affect the body which they represented, in common with every other Chemist and Druggist throughout the country, as well as the public at large. The clause to which he alluded was as follows:—

"And be it enacted, that every person who, after the passing of this Act, shall act or practise as an Apothecary in any part of England or Wales, without having been registered by the said Council of Health as a General Practitioner in Medicine, Surgery, and Midwifery, shall for every such offence forfeit and pay the sum of twenty pounds, to be applied to the use of the said College, to be recovered by action of debt in any of Her Majesty's Courts of Record at Westminster."

The PHARMACEUTICAL SOCIETY had been established with the two-fold object of promoting the education of the Pharmaceutical Chemists of this country, and of protecting its members against any unjust encroachments upon their accustomed rights and privileges. The Council had always had these objects in view, and, although unwilling, by appealing to Parliament to impose any obstacles to the settlement of the question of Medical reform, yet felt it their duty to offer a strenuous opposition to the Bill in its present form. In doing this, however, they were anxious to avoid collision with the other branches of the Medical Profession; they had no wish to interfere in any way with the General Practitioners; and he trusted that the Meeting would set an example, by the temperate manner in which they expressed themselves, and by the moderate and reasonable nature of their demands, that might be followed with advantage by their brethren throughout the country. The Council had, in the first instance, addressed a memorial to Sir James Graham, respectfully calling his attention to the injurious operation of the clause in question, and requesting the favour of an interview on behalf of the Society. In the belief that some obstacle existed to a compliance with this request, they had considered it their duty to call the Meeting; but a communication had subsequently been received from the Home Office, which they hoped might lead to a favourable result. This, however, being at present unknown, they could not do otherwise than proceed with the business for which they had assembled. The Chairman was glad to inform the Meeting that he had been favoured with an interview with

Mr. Warburton, who had expressed much interest in the proceedings of the Chemists, and had readily consented to advocate their cause in Parliament if it should be found requisite to make any exertions in that quarter.

Mr. Jacob Bell moved the first resolution :—

"That this Meeting observes with regret and apprehension the alterations recently made in the Bill for Regulating the Profession of Physic and Surgery now before Parliament, and feels bound to offer to the Bill, in its present state, the most strenuous opposition."

Mr. Bell observed, that the present Bill was more objectionable than that of Mr. Hawes, as the definition of the term "acting as an Apothecary" was omitted, and this might be interpreted so as to subject Chemists to constant penalties. It was not the wish or the interest of Chemists to become Medical men. This would result in their place being supplied by another class, and they would ultimately be as badly off as the Apothecaries, whose position, he contended, was by no means enviable. But the Chemists were often called upon to give an opinion as to the doses and properties of Medicines; in some trifling cases they were applied to by the poor, who could not get medical advice; and in cases of emergency, such as poisoning, it was their duty to administer an antidote, or use their endeavours to give relief. In all these cases they would be liable to a penalty by the proposed Bill. The dispensing of prescriptions was also according to recognised authorities and definitions comprised in the office of the Apothecary, although practically it was chiefly performed by Chemists. The ancient Apothecaries were merely dispensers of Medicines; and as late as the year 1815 it was a disputed point whether the Chemists had a legal right to perform that office. By the Apothecaries' Act of 1815, the Apothecaries were recognised as Medical Practitioners, and the Chemists as Dispensers. There was but one clause in any Act of Parliament which gave Chemists this legal right, and that clause was about to be repealed. As the law would not be administered by those who had framed it, the interpretation might be very different from that which was intended, and Chemists would be liable to constant persecution, or be reduced to the condition of mere venders of simple drugs. Mr. Hawes, while he proposed to restrict Chemists, proposed also to raise their character, to make them an educated body, to give them rank and privileges. The present Bill did not even recognise their existence, while it indirectly inflicted very objectionable restrictions without giving any privileges whatever. The Bill would also be injurious to prescribing Surgeons, who are not in the habit of furnishing Medicines, and who, by the clause under consideration, would be liable to the penalty if on any emergency, or under any circumstances, they acted as Apothecaries, unless they happened to belong to the New College of General Practitioners, as well as to the College of Surgeons. It was therefore, for several reasons, absolutely necessary to oppose that portion of the Medical

Bill which would, if carried, be a source of constant litigation and great injury to the Chemists, as well as to the public at large.

In opposing the introduction of the obnoxious clause, the Society ought not to be considered as acting in opposition to the Government—on the contrary, the principles for which they contended were precisely the same as those of Sir James Graham, as expressed in Parliament. It would be for the meeting to decide what steps should be taken, and it was greatly to be desired that in coming forward on the present occasion in support of their vested rights and interests, they should maintain that unanimity which had prevailed among their body for several years. Party disputes should studiously be avoided. It was not the business of the Chemists to quarrel with the Apothecaries, but to defend themselves:. Nor was it only the Chemists whose interests were at stake. The public were no less concerned in the matter. The English public would not submit to the restrictions imposed by the Bill now before the House, on those to whom they daily applied for medicine, and from whom they constantly required information on various points, in which a Chemist ought to be perfectly qualified to enlighten them; if he were not so, he would not be a fit and proper person to deal in poisons and other powerful substances. Since the meeting had been summoned, and circulars issued throughout the country, a communication had been received from the Home Office, and there was reason to hope that this would result in a favourable arrangement; but it would not be safe to trust to a mere hope, and the appeal having been made to the body at large, it was necessary to proceed, as whatever demonstration might ensue it would be taken to represent the sentiments of the body. Even if the Government should consent to withdraw or modify the clause in question, it would be necessary for the Chemists to secure support in Parliament, and thus to guard against the possibility of other clauses being introduced in committee which might be equally objectionable.

Mr. **Bell** hoped the Chemists would come forward calmly and temperately, yet firmly, in support of their accustomed privileges, and set a good example to the Medical Profession, by abstaining from those disputes and dissensions which unfortunately were too prevalent among other bodies.

Mr. **Squire**, in seconding the Resolution, expressed his concurrence in what had been stated by the previous speakers. He thought Sir James Graham could not fully approve of the Bill in its present form, as it was entirely different from that originally introduced by him. In the Apothecaries Act of 1815, the dispensing and preparation of medicines was mentioned as part of the duty of the Apothecary, although the Chemists were also recognised as dispensers.

Mr. **Barclay** spoke in favour of the resolution, which was carried unanimously.

Mr. BARTLETT moved the second Resolution :—

"That the term 'acting or practising as an Apothecary,' occurring in Clause 36 D, may be construed to apply to acts which are necessarily involved in the daily avocations of the Chemist and Druggist; and that this Clause, besides placing on the Chemist a restriction, alike unjust to him and injurious to the public, would be a source of continual litigation."

That meeting, he said, had brought to his recollection, the occasion when they had assembled in that room some years ago, for the purpose of opposing Mr. Hawes' Bill, and he trusted that the measures they might now deem it necessary to adopt would be followed with the same satisfactory result. The clause which had been read to them was quite as objectionable as any in Mr. Hawes' Bill, and he thought if it were passed into law, it would be impossible for the Chemist and Druggist to carry on his business without being constantly liable to the penalty imposed by it. He thought, also, it would prove injurious to Medical men and to the public, for it was customary for both these parties to apply to the Chemist for information respecting many of the remedies employed in medicine. The Council of the PHARMACEUTICAL SOCIETY were entitled to the thanks of the Members of the trade generally, for the active steps they had taken in reference to this matter, and he trusted they would be supported by the great body of the Chemists throughout the country in the appeal they were about to make to Parliament.

Mr. D. B. HANBURY seconded the Resolution.

Mr. TOSWILL reminded the meeting of the annoyance to which they had been exposed in reference to the sale of spirit of wine, arising principally from the difficulty in determining in what cases the Chemist was liable to the penalty for selling that article; and he contended that the Clause now in question, would be quite as much a source of annoyance and litigation in reference to the sale of medicines generally. The Resolution was carried unanimously.

Mr. JOHN BELL, in rising to move the next Resolution, observed, that he had been much gratified in being present at so numerous and so unanimous a meeting. He trusted that the unanimity with which they had commenced would be maintained, for "unity is strength." He moved

"That the dispensing of prescriptions, and the preparation of medicines in general, is now, and has been for many years, principally performed in this country by the Chemists and Druggists; and that, in the Apothecary's Act of 1815, a clause was introduced for the purpose of securing to the Chemist and Druggist the rights and privileges which he had previously enjoyed, and exempting him, in the exercise of his accustomed business, from the penalties imposed by that Act."

Mr. GIFFORD seconded the Resolution, which was carried unanimously.

Mr. THOMAS HERRING moved,

"That the Chemists and Druggists throughout the country be recommended to petition Parliament not to pass the Bill for Regulating the Profession of Medicine and Surgery in its present form; that the following Petition be adopted by this Meeting; and that Mr. Warburton be requested to present it to the House of Commons :"

"*To the Honourable the Commons of the United Kingdom of Great Britain and Ireland, in Parliament assembled.*

"The humble PETITION of the undersigned Chemists and Druggists, carrying on business in London and its vicinity,

"Sheweth,

"That your Petitioners observe with apprehension the 36th clause (D) which has been introduced by the Committee of your Honourable House into the Bill which is now in progress for Regulating the Profession of Physic and Surgery.

"That the liability to the penalty proposed by the said clause, in case any person shall act or practise as an Apothecary, without having been registered by the Council of Health as a General Practitioner in Medicine, Surgery, and Midwifery, will seriously affect your Petitioners in the conduct of their business; and will also, as they apprehend, be injurious to the public interests, inasmuch as it may be so construed as to prevent your Petitioners from replying to any questions which may be proposed to them, as to the application or effect of the several Drugs or Chemicals sold by them, or from giving such suggestions as they may consider necessary or expedient with respect to the use and application of such articles.

"That the Act of the 55th George III., chap. 194, which is now in part proposed to be repealed, contains a clause in the following words:—

"*Provided always, and be it further enacted, That nothing in this Act contained shall extend, or be construed to extend, to prejudice or in any way to affect the trade or business of a Chemist and Druggist, in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner and as fully and amply to all intents and purposes, as the same trade or business was used, exercised, or carried on by Chemists and Druggists before the passing of this Act.*

"That such clause is proposed to be repealed.

"That on the occasion of the passing of the said Act of the 55th George III., chap. 194, very considerable discussion took place as to the rights and interests of your Petitioners in the conduct of their said business, and the protection contained in the said clause was conceded to them, after very full consideration of their case, by your Honourable House.

"That the passing of the said Bill now in progress, without the addition of such a saving clause as above set forth, would be an invasion of the rights and interests of your Petitioners as enjoyed under the above Act, and is not, as your Petitioners contend, for the public benefit.

Your Petitioners therefore humbly pray your Honourable House, that the said Bill may not pass into a law as it now stands; and that your Petitioners may be heard by themselves or their Counsel, at the bar of your Honourable House in support of their Petition, or that they may have such other relief in the premises as to your Honourable House may seem meet."

Mr. Herring was glad to find that so able an advocate of their cause as Mr. Warburton had consented to present their petition to the House of Commons; but he begged to remind those present that they might individually promote the cause very much by endeavouring to interest the Members of Parliament for their respective localities in their behalf.

Mr. Lescher seconded the Resolution, he had referred to several works of authority for the definition of the term Apothecary, and in all of them he found it defined so as to comprehend the duties of the Chemist and Druggist, much more than those of the General Practitioner.

The Resolution was carried unanimously.

Mr. PIGEON moved, and Mr. M'CULLOCH seconded a vote of Thanks to Mr. Morson for his uniform attention to the interests of Chemists and Druggists and especially for his conduct this day in the chair.—Carried unanimously.

The Chairman acknowledged the vote, and dissolved the Meeting.

After the close of the Meeting, a deputation of the PHARMACEUTICAL SOCIETY, with Mr. Garrard, the solicitor, were favoured with an interview with Mr. Bethune, at the Home-Office Chambers, who on behalf of the Government, entered very minutely into the consideration of the merits of the case, and endeavoured to reconcile the differences of opinion existing on the subject. It was admitted on both sides that it was impossible to define precisely the boundary line between the office of the modern Apothecary and that of the Chemist. It was not the intention of Sir James Graham to interfere in any way with the prerogative of the Chemists as dispensers of medicine; but in compliance with the suggestions of Mr. Upton, the solicitor of the Apothecaries' Company, he had introduced the clause which had been objected to, in order to restrain the abuse of privilege, which had been alleged to prevail among Chemists, especially in some populous districts. Mr. Upton had contended, that as the most stringent penal clause in the Act of 1815 would be repealed, the clause 36 D in the new Bill would not interfere with the province of Dispensing Chemists, but would merely restrain them from taking an unfair advantage of the exemption granted them in the Apothecaries' Act. Mr. Garrard confuted this opinion, observing, that the clause in question would reduce the Chemist to a mere vendor of simple drugs, who dare not open his mouth under any circumstances, to express an opinion as to their properties, or give to his customers any caution or information respecting the mode of employing them. Mr. Bethune admitted that the PHARMACEUTICAL SOCIETY had endeavoured to discourage the practice of medicine among the Members; but he contended that it nevertheless prevailed to a considerable extent, and observed that no law could be devised which would entirely prevent it. At the same time it was desirable to keep this abuse within due bounds, and Mr. Upton had claimed on behalf of the Apothecaries a restrictive clause for this purpose. Mr. Garrard contended that it was not fair to impose so severe a restriction, simply because the boundary line between the respective functions of the two classes could not be defined; and the deputation respectfully submitted that the proposed remedy would be a greater evil than that which already existed. It was also suggested, that by introducing an improved system of pharmaceutical education, the alleged abuse would be more effectually checked than it would by the imposition of penalties. Mr. Bethune proposed to draw up a clause, exempting the Chemists from penalties to a certain extent, and at the same time placing some limit on their power of prescribing. The deputation stated that they should not feel justified in accepting any clause which was not in effect the same as that quoted in the petition. As they were acting on behalf of a numerous and influential body, they felt the responsibility of their duty in this respect, and trusted that Sir James Graham would not place the Chemists in a worse position than they were in under the Apothecaries' Act of 1815. Mr. Bethune promised to give the subject his further consideration, and to confer again with Mr. Upton, expressing his willingness to receive the deputation at a future time, or as often as it might be found desirable.

At the same time that the Council summoned the meeting at the Crown and Anchor, they issued a circular to the provincial secretaries, with a form of petition, the substance of which they recommended for general adoption, and meetings were held in most of the large towns to carry out the recommendation. It was also suggested by the Council, that communication should be made in each locality with the representatives in Parliament, and this was done in a majority of cases. A considerable number of petitions, however, were forwarded to Bloomsbury Square, and presented to Parliament, by Mr. Warburton, with the London Petition, on the 9th of June.

A separate Petition was also drawn up on behalf of the Pharmaceutical Society in the following terms;—

"*To the Honourable the Commons of the United Kingdom of Great Britain and Ireland, in Parliament assembled.*

"The humble PETITION of the PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, incorporated by Royal Charter,

"SHEWETH,

"THAT your Petitioners having been for some time prior to their incorporation associated for the more especial purpose of advancing Chemistry and Pharmacy, and promoting a uniform system of education among persons practising the same, and their exertions having been attended with considerable success, it pleased Her Most Gracious Majesty to encourage their design, by granting to your Petitioners Her Royal Charter of Incorporation, dated the 18th day of February, 1843.

"That your Petitioners' attention has been drawn to the Bill now in progress through your Honourable House, intituled 'An Act for Regulating the Profession of Physic and Surgery,' and in particular to the clause No. 36 (D), in the said Act, by which it is proposed to be enacted,

"'That every person who, after passing of this Act, shall act or practise 'as an Apothecary, in any part of England or Wales, without having been 'registered by the said Council of Health as a General Practitioner in 'Medicine, Surgery, and Midwifery, shall for every such offence forfeit and 'pay the sum of twenty pounds, to be applied to the use of the said College 'of General Practitioners in Medicine, Surgery, and Midwifery, and to be 'recovered by the said College by action of debt in any of Her Majesty's 'Courts of Record in Westminster.'"

"That the dispensing of Prescriptions, and the preparation of Medicines in general, anciently the peculiar province of the Apothecary, is now, and has been for many years, principally performed in this country by the Chemists and Druggists.

"That your Petitioners find from experience the importance of inquiring of persons applying for Drugs or Chemicals, as to their knowledge of the use and application of such articles, and the necessity of urging caution in the mode of application which the purchaser proposes to pursue.

"That such observations necessarily lead to inquiries on the part of such purchasers, which inquiries, if answered, may be construed so as to bring the parties concerned within the scope of the objectionable clause in the proposed Bill.

"That while your Petitioners disclaim any intention to interfere with the rights or duties of the Medical Practitioner, they nevertheless submit that to impede them in the discharge of their duties, in as ample a manner as they have always hitherto performed, and do now perform the same, would be attended with great injury to the public, and would totally prevent any further improvement of persons following the business of Chemists and Druggists, inasmuch as they would be reduced to mere vendors of Drugs, without licence or ability to express the slightest opinion of their beneficial or injurious tendency.

"That applications are daily made for Drugs which would be highly improper to be used for the purposes proposed, and often to an extent which would be destructive of life; and in case it should happen that the Prescription of a Medical Practitioner should contain an error, the Dispenser of the Medicine ought to be able to detect it.

"That it would be greatly for the public benefit that all persons following the business of Chemists and Druggists should, prior to their being recognised as such, be examined by some competent Board, as to their knowledge of Pharmacy and their general scientific acquirements, tending to render them competent for the proper discharge of their duties.

"That such an enactment would greatly raise the standard of qualification of such persons, while the present proposed enactment would extinguish all hope on the part of your Petitioners, that the Chemists and Druggists of this kingdom may, by proper regulations, become a highly scientific body.

"That upon the passing of the 55th Geo. III., c. 194 (commonly called the Apothecaries Act), the Legislature, after considerable discussion, consented to the insertion of a clause (whch now forms the 28th section of that Act), by which it was provided, that all persons using or exercising the trade or business of a Chemist and Druggist might 'use, exercise, and carry on the same, in such manner, and as fully and amply to all intents and purposes as the same business was used, exercised, or carried on by Chemists and Druggists before the passing of the Act,' and which last-mentioned clause is now proposed to be repealed.

"That your Petitioners submit that no case has been shown to your Honourable House for the removal from your Petitioners of the protection afforded them by the last-mentioned Act; while the introduction of such a clause as that above complained of, would very seriously affect your Petitioners in the conduct of their business, by rendering them liable to harrassing and vexatious prosecutions for the recovery of penalties, to which they must inevitably become liable in the ordinary discharge of their daily avocations.

> "Your Petitioners, therefore, pray your Honourable House, that so much of the said Act of the 55th Geo. III., c. 194, as is contained in the 28th section thereof, may be re-enacted in the said Bill now under your consideration, thereby extending to your Petitioners a similar Protection to that hitherto enjoyed by them."

This Petition was also placed in the hands of Mr. Warburton on the 9th; but on the morning of the same day, a communication was received by Mr. Garrard, from Mr. Bethune, inclosing a clause which the Government had consented to insert in the proposed Bill. It is as follows:

Act not to affect Chemists and Druggists.

> "Provided always, and be it enacted, That nothing in this Act contained shall extend to prejudice or affect the trade or business of a Chemist and Druggist in the buying, preparing, or compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail; but all persons using, or who shall hereafter use the said trade or business, may carry on the same in such manner and as fully to all intents and purposes, as the same trade or business was carried on by Chemists and Druggists before the passing of this Act."

Mr. Garrard, after having carefully considered this clause, pronounced it to be, in every respect, identical in effect with the one in the Act of 1815, and advised the Council to acquiesce in the proposition. Accordingly Mr Warburton, in presenting the Petitions which had been placed in his hands (above one hundred in number) informed the House that Sir James Graham had consented to insert a clause which was satisfactory to the Chemists.

The above was but a small proportion of the total number of Petitions from Chemists, the remainder having been presented to the House by the local representatives, many of whom had undertaken to support the prayer of the Petitions, and to use their influence in obtaining the desired alteration in the Bill.

On the 5th of June, the Council of the College of Surgeons adopted a statement, which was published in the medical periodicals, protesting against the recent alterations in the Bill in reference to the proposed College of General Practitioners, and also complaining of a want of uniformity in the examinations in the three kingdoms, by which they contend that the London schools will materially suffer.

The College of Physicians has likewise remonstrated against some of the recent alterations.

The recommittal of the Medical Bill, which had been fixed for the 9th of June, was adjourned to the 19th, and subsequently to the 27th. In the mean time a formidable opposition to the proposed new College has been organized among the General Practitioners, and Mr. Guthrie (one of the members of Council of the College of Surgeons), at the requisition of the dissentients, consented to preside at an aggregate meeting convened on the 24th.

Thus the Bill in its present form is likely to be opposed by the College of Physicians, the College of Surgeons, and a considerable proportion of the General Practitioners. Under these circumstances, there is no reason to expect that it will be passed during the present session.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

ABSTRACT OF A LECTURE
ON SOME RECENT DISCOVERIES IN ORGANIC CHEMISTRY.

BY GEO. FOWNES, F.R.S.,

Lecturer on Chemistry to the Pharmaceutical Society.

Mr. Fownes commenced with a sketch of the progress made in practical organic investigation, by giving an account of the methods of research now in use, which have already reached a most wonderful degree of precision and accuracy; this is indispensable, since the ultimate analysis constitutes the only key to the knowledge of organic bodies, and of the changes they are capable of undergoing. A great part of the lecture was occupied by a history of the "alcohols," a small, but important class of bodies formed on the type of common or wine-alcohol, comprehending in addition to that substance, wood-spirit, and the oil of potato and corn-brandy, upon which the recent researches of MM. Cahours and Balard have conferred a high degree of interest.

The group of bodies known as the vegeto-alkalies were then discussed, and their general characters and peculiarities of composition pointed out. Attempts to form by artificial means bodies of this class, have met already with partial success. It was long ago noticed by Dumas, that the volatile oil of black mustard formed with ammonia a crystalline compound, from which neither the oil nor ammonia could again be obtained.

Dr. Will, of Giessen, has examined this substance, and shown that it possesses all the characters of a true organic base. Mr. Fownes concluded by detailing some experiments of his own relating to this subject, in which he had been so fortunate as to succeed in producing by artificial means two new bases, having marked Alkalinity, and the power of forming beautiful crystallizable compounds with acids; one of these was derived from Doberginer's "artificial oil of ants," and the other from volatile oil of bitter almonds. The original memoirs were read before the Royal Society, and will appear in the transactions of that body, from which they will be quoted in this Journal.

PHARMACEUTICAL MEETING,

JUNE 11th, 1845.

MR. MORSON, VICE-PRESIDENT, IN THE CHAIR.

THE Chairman said, the business which would first claim the attention of the Meeting would be the distribution of the Prizes to those Pupils who had been the successful competitors for them at the examinations in the classes of Materia Medica, Chemistry, and Pharmacy. Before, however, he performed the pleasing duty of presenting these prizes, he must request the lecturers to report the results of the examinations.

Dr. PEREIRA had much pleasure in reporting the result of the examination in MATERIA MEDICA. The questions were as follows:

1. What is the chemical difference between *Decoction of Hartshorn shavings and Decoction of Bone shavings?* Is the gelatinous matter extracted by boiling from isinglass, hartshorn, and bones, *collin* (common gelatine) or *chondrine?* How are these two animal principles to be distinguished from each other?

2. Some golden green particles (suspected to be the powder of cantharides) mixed with other matters, being found in beer, of which a person has partaken and been poisoned: You are required to state how you would proceed to extract their active principle, and to test its vesicating powers.

3. How is the presence of flour in honey to be determined? also of flour, lard, and resin in wax?

4. Some tincture of nutgalls having been kept for some months, is found to have lost its power of precipitating solutions of the vegetable alkalies, though it still retains the property of forming inky liquids with solutions of the ferruginous salts: Explain the nature of the chemical changes which it has suffered.

5. A sample of commercial flour of mustard is placed before you: You are required to state whether it contains any white mustard, and to mention the grounds on which you form your opinion.

6. State the botanical name and natural order of the plant which yields Elaterium. Explain, according to the laws of Endosmosis and Exosmosis, the bursting of the fruit when ripe. Describe the mode of obtaining Elaterium, and the precautions to be observed. Name the chemical constituents of Elaterium, and state how the bitter principle, the resin, and Elaterine are to be respectively obtained. Point out the best methods of determining the purity of Elaterium; and state the proper dose of this substance when pure.

7. What are the chemical means of detecting the existence of Guaiacum when this substance is suspected to be present in some other resinous body.

8. You are required to name the five feculas respectively labelled *A*, *B*, *C*, *D*, and *E*.

9. Describe the botanical characters and medicinal properties of the natural orders *Coniferæ*, *Compositæ*, and *Lauraceæ*. Name the officinal articles respectively obtained from these orders.

10. What are the names of the barks respectively yielded by *Cinchona lancifolia*, *C. cordifolia*, and *C. oblongifolia*? What are the names of the barks which are known in England, and are designated in the London Pharmacopœia as the barks of these species? Explain the circumstances which have led to the confusion of nomenclature.

11. How would you detect the presence of Castor Oil, or other fixed oil, in Balsam of Copaiva?

12. How is the presence of copper in Oil of Cajuputi to be detected?

13. Explain the structure of umbelliferous fruits, especially pointing out the situation of the receptacles of volatile oil. What officinal umbelliferous fruit has its secondary ridges (*juga secondaria*) more prominent than its primary ones (*juga primaria*)? By what characters would you distinguish Hemlock fruit from other fruits of the same order?

14. A Pharmaceutist in a newly discovered colony is anxious to know whether the Lichens of the country are adapted for the manufacture of Orchil and Litmus: which is the readiest and most satisfactory test for him to employ?

[*A Microscope and appropriate Chemical Tests, for enabling the Candidates to reply to some of the above Queries, were supplied on application.*]

Dr. Pereira had usually found in his examinations, that the questions he submitted to the pupils were a little in advance of their proficiency, and indeed, it was necessary that this should be the case, in order to make the examination a test of extent of knowledge; but in the present instance, although it would, he believed, be generally admitted that the questions were some of them neither easy nor superficial, yet it appeared that the pupils were prepared for still more difficult questions, and that he had underrated the extent of their proficiency. This circumstance was highly creditable to the Institution, and especially to the pupils themselves. He had had some experience as a teacher and an examiner, but he could not recollect ever to have been more gratified with the result of an examination than he had been on this occasion. The pupil to whom he had adjudged the first prize, had furnished excellent answers. The writing was good, the punctuation was good, the use of capital letters in botanical names was uniformly correct; the descriptions were concise yet perfectly explicit, and the facts were all correctly stated. Indeed, he might say that the answers of this pupil were in every respect fit to be put into the hands of a printer for publication, and he believed the matter to be quite as good as nine-tenths of what was published on the same subjects. In the answers of several of the other competitors, there was considerable equality, and they were all good, so that he had some difficulty in deciding to which to adjudge the second prize. Besides the two prizes, he proposed that four certificates of merit should be given, and he might add that the answers even of the last among those to whom he adjudged certificates were so good, that had there not been others that were better, he would have felt fully justified and satisfied in awarding to him the first prize.

The names of the successful competitors were then announced, as follows:—

First Prize......Mr. William Wilkinson, 37, Berners Street.
Second Prize ...Mr. John Robinson Rogers, 17, Bloomsbury Square.

Certificates of Merit:
Mr. John Townsend M'Owan
Mr. George Frederick Schacht, 17, Bloomsbury Square.
Mr. Joseph B. French, 17, Bloomsbury Square.
Mr. John Horncastle, Tottenham Court Road.

Mr. Fownes gave a highly satisfactory account of the examination in the class of Chemistry. He had been much gratified not only with the result of the examination, but also with the uniform attention and interest manifested by the pupils at the Lectures. The Questions were as follows:—

[*The number affixed to the* right *of each Question is intended to denote its comparative value.*]

1. Describe the principle of the methods in use for determining the Specific Gravities of Solids, Liquids, and Gases. Give the details of practice in the cases of Solids and Liquids, the simplest and most ordinary means being employed . . 100

2. The construction and graduation of a thermometer; explain the relations existing between the scales in use, and then how they may be translated the one into the other . . . 100

3. State briefly but as explicitly as possible the chief phenomena of vaporization (ebullition, surface-evaporation, &c.) with a few details of the practice of distillation in several distinct cases 50

4. Describe the preparation and properties of Oxygen, Hydrogen, Nitrogen, and Chlorine 100

5. Describe the method of procuring phosphorus; its properties; the several modes of procuring phosphoric acid, and the chief peculiarities of that substance 50

6. Give a notice of potassium, and the chief potash salts 50

7. Mention the preparation, properties, and composition of some of the more important compounds of iron 50

8. Mention the preparation, properties, and composition of some of the chief compounds of mercury 50

The Prizes and Certificates were awarded as follows:—

First Prize. . . Mr. Benjamin Horatio Paul, 17, Bloomsbury Square.

Second Prize. . Mr. George Frederick Schacht, 17, Bloomsbury Square.

Certificates of Merit:

Mr. Joseph B. French, 17, Bloomsbury Square.
Mr. John A. Spencer, 38, Lamb's Conduit Street.

Mr. Redwood reported the result of the examination in the class of Pharmacy. In the examination in this class, the Pupils had been divided into, 1st, those merely attending the Lectures; and, 2dly, those who were also Practical Pupils, working in the Laboratory of the Society. The following were the Questions:—

1. What are the fusing points of zinc and tin? How are these metals usually reduced to a state of minute division, and upon what property in the metals does the result depend?

2. What is the meaning of the term *latent heat* in the sense in which it is usually employed by chemical writers? What is the latent heat of water, and of the vapour of water? Is the latter constant in the evaporation of water, and what law has been recognised in reference thereto?

3. Describe the process of the London Pharmacopœia for the preparation of diluted hydrocyanic acid. State the composition of this acid, the proportion of real acid which it contains, the substances with which it is likely to be contaminated or mixed, the effect of the presence of impurities, and the means of detecting them, and of determining the strength of the acid.

4. What is *sulphuric ether* of the Pharmacopœia? Describe the processes of the London and Edinburgh Pharmacopœias for obtaining it, and give an account of the theories of etherification.

5. Give practical details of the methods of preparing *tartaric acid*, *oxysulphuret of antimony*, *biniodide of mercury*, and *liquor potassæ*, together with the precautions to be observed, and explanations of the processes.

6. What is the composition of the *carbonate of magnesia* of commerce, and how are the different varieties of it prepared?

7. Crystalline forms are now generally arranged in six principal divisions or systems:—*The cubic, the square prismatic, the right prismatic, the oblique prismatic, the doubly-oblique prismatic, and the rhombohedric.* To which of these systems do the crystals of the following salts respectively belong:—1. *Sulphate of magnesia;* 2. *Sulphate of soda;* 3. *Sulphate of copper;* 4. *Ferrocyanide of potassium;* 5. *Iodide of potassium;* 6. *Nitrate of bismuth?*

8. Describe the best methods of determining the strength or purity of the following substances:—1. *Nitric acid;* 2. *Sulphuric acid;* 3. *Liquor potassæ;* 4. *Nitrate of silver;* 5. *Iodide of potassium;* 6. *Oxide of zinc.*

Prizes and Certificates were awarded as follows:—

LECTURE PUPILS.

Prize ....Mr. Samuel Thomas Baxter, Holborn.

PRACTICAL PUPILS.

Prize ....Mr. George Frederick Schacht.

Certificates of Merit:

Mr. Joseph B. French.
Mr. William Johnson.

The Chairman then presented the prizes to the parties to whom they had been respectively adjudged. The prizes consisted of the following books, handsomely bound:—*Brande's Manual of Chemistry; Pereira's Elements of Materia Medica; Turner's Elements of Chemistry; Daniell's Introduction to Chemical Philosophy; Thomson's Organic Chemistry of Vegetables; Ure's Dictionary of Arts and Manufactures; Fresenius's Chemical Analysis.*

The following papers were read:—

ON THE ARGEMONE MEXICANA, HURA CREPITANS, JATROPHA CURCAS, AND MULTIFIDA.

BY W. HAMILTON, M.D., PLYMOUTH.

A variety of causes, unconnected with the subject of these papers, have occasioned a longer interruption in their continuation than I could have wished; those causes having, however, ceased in a great degree to operate, I once more resume the series.

But before I proceed with the more legitimate objects of consideration, I must crave the indulgence of my readers to a fact of some interest, in connection with the physiology of vegetables, which has been communicated to me since the appearance of my last paper, by an ingenious and scientific friend who has made the botany of the East Indies a peculiar object of his study. This gentleman, in the course of his enquiries into the original habitat of rice—the paddy of the Orientals—has ascertained that the *Argemone Mexicana*, which formed the subject of my last paper, is found in India, as he is led to believe, from the information which he has succeeded in obtaining, *exclusively* in the fields employed in the culture of rice, and in these it is found to spring up *invariably* after the harvest of that grain has been gathered in. The mystery in which the phenomenon thus stated is enveloped, arises *not* from the circumstance of the one crop springing up on the removal of the other, but from the *invariable*, or *supposed invariable*, character of that succession, and its being confined, as my correspondent seems inclined to believe, *exclusively to that description of grain.*

It has long been known to botanists that, on the removal of forests of one description of trees, the soil upon which they grew, if left to the undisturbed operations of nature, will, in process of time, be clothed anew with a forest *not of the same* but *of a totally distinct species* of trees; but I am not aware that *in this case* any particular order of succession is invariably observed, as is said to happen with respect to the Oryza and the Argemone; plants of habits so extremely dissimilar that, but for the very high authority upon which the statement rests, I should find considerable difficulty in reconciling the fact to my belief.

Were the Oryza cultivated on dry soils, such as appear most congenial to the habits of the Argemone, we might easily understand how the seeds of that plant, accidentally intermingled with the grains of the former, might be planted along with them, and lie dormant in the ground till the removal of the more vigorous vegetation of the rice gave them a more ready access to the oxygen of the atmosphere, and thus facilitated that conversion of their amylaceous constituent into the sugar, so essential to germination. But when we recollect that the paddy fields are usually situated in low marshy grounds, unfriendly, it might be supposed, to the habits of the Argemone, and covered besides, during nearly the whole period of the growth of the rice, with a considerable depth of stagnant water, it is difficult to understand how the seeds of the Argemone could escape destruction,—and still more how their germination should so *invariably* succeed to the harvest of the other. These are problems worth the labour of enquiry and the task of solution.

But to return from this digression, which partakes more of a physiological than a pharmaceutical or economical character.

At the close of my last paper I incidentally noticed the seeds of the Hura crepitans, or sand-box tree, as worth the attention of medical enquirers, with a view to their application to the purpose of Pharmacy; but even should the results of these experiments be less favourable than I am inclined to anticipate, there can be little doubt that the fixed oil which could be abundantly obtained from them, is capable of being usefully employed to a considerable extent both in Pharmacy and the arts. Notwithstanding their extreme brittleness, the sand-box trees frequently attain to most gigantic dimensions, and their timber is advantageously employed by the sugar-planters of South America, in the formation of vats for the preservation of the guarapo, or juice of the cane, and molasses. A vat of this description, hollowed out of the trunk of a single sand-box tree, was found, by M. Bonpland to measure no less than fourteen feet in length by eight feet in breadth. In our West Indian islands, where it is sufficiently abundant, even this subsidiary use is not made of it.

I have also referred, in my last paper, to the mischievous and unnecessary practice of adulterating the oil obtained from the seeds of the *Argemone* with that obtained from the nuts of the *Jatropha curcas*, or common physic nut, a shrub extensively found in the hedges and waste places of most countries situate within, or upon the confines of, the tropics.

But however drastic and disagreeable the oil obtained in the *ordinary* manner from the seeds of this shrub has been found, I have reason to believe that, by a caution, similar to that suggested when speaking of the sand-box, it might be divested of much, if not the whole, of its objectionable qualities, and converted into a mild and economical addition to the list of our most useful aperients. The nuts of the *Jatropha curcas* contain, as Browne acquaints us, an almond-like kernel, grateful to the palate, and divisible into two hemispheres, between which are interposed two thin cotyledons, wherein the acrid principle, which is communicated to the oil when subjected to the action of either heat or pressure, without separation, will most probably be found to reside. By carefully detaching these cotyledons from the two hemispheres of the seeds previous to expression, a process which might be easily and effectually accomplished by appropriate machinery, and by employing pressure unaided by heat, an oil would no doubt be obtained free from acrimony and fit for internal use; while a coarser oil, adapted to many economic purposes, might be obtained, by calling in the assistance of heat, from the residuary mass. The oil obtained, even without these precautions, has occasionally been admitted into West Indian practice, and exhibited, in half-ounce doses, as a hydragogue in dropsical affections.

Roasting, is said by Grainger, to mitigate the virulent action of these seeds; but, as the application of heat would most probably facilitate the combination of the oil with oxygen, rendering it, what is termed in common parlance, rancid, I should be rather disposed to anticipate an opposite effect from the process.

A cataplasm of the leaves applied hot to the bowels is a common and effectual remedy in allaying the agony of flatulent colic, from which circumstance this plant has acquired the name of *Belly-ache bush*, by which it is known in many of the English islands; but its efficacy in such cases arises most probably chiefly from the heat. The late Dr. Wright of Jamaica, however, informs us that their decoction is advantageously employed internally, in cases of *spasmodic colic, accompanied by vomiting*, sitting easier on the stomach than any other medicine, and rarely failing to relieve the bowels mildly of their contents. In this they correspond in some degree with the seeds of the argemone, and would appear to possess an *anodyne property*, which may co-operate with the heat in affording relief from pain, when applied in the form of cataplasm.

But independently of its seeds and leaves, the *juice* of the *Jatropha curcas*, or *English physic nut* as it is called, in contradistinction to the *Jatropha multifida*, or *French physic nut*, a plant of less frequent occurrence, is highly spoken of: and Lunan, in his *Hortus Jamaicensis*, vol. ii., p. 62, gives the following illustration of its effects, upon the authority of Mr. Oliver Herring, a gentleman of high respectability, resident in the parish of Westmoreland, by whom it was communicated;—

> "I was attacked by the piles, I believe in consequence of taking aloes with calomel, and suffered for several weeks incredible torments. The sphincter and rectum were violently swelled and indurated, the latter apparent for some inches upwards, and there was a considerable discharge of pus. My medical friends apprehended that I had a fistula, and were considering of the usual operation, but gave me some time to decide on submitting to it. In this interval, I used an ointment made of the milk of the physic nut shrub, mixed with half its quantity of melted hog's lard, and applied inwardly, as far as it could be pressed. In *five days* all the swelling and induration were reduced, and, *in a week*, I was *perfectly free from pain*. This remedy was told by an old Coromantee woman to her mistress, who is my neighbour, and by her communicated to me. It is very astringent, and gives an ugly stain to linen. I have since heard that this juice, which is acquired by cutting or breaking the branch of the shrub, is commonly used by negroes in dispelling tumours. In mercy to sufferers in the same way, this ought to be published."

The interesting history thus communicated by Mr. Herring, cannot fail to awaken a recollection of the cancer remedy, noticed in my last paper; the active constituents of which were the juices of the *Argemone mexicana* and the *Jatropha multifida*—and to suggest the presence of some common principle in the sap of both these families of plants, which, like the quinia, veratria, and other active principles of modern Chemistry, might, no doubt, be advantageously obtained, in a detached and more portable form; and thus rendered more available for the purposes of European Pharmacy. The seeds of the *English physic nut* are termed by the Spaniards *avellanas:* those of the *French physic nut* are sometimes called *tyle berries* of India. The properties of these last resemble the former, but are more active; although, when deprived of their cotyledons, the severity of their operation is greatly mitigated. The oil obtained from them is used for burning, and its external application is said to remove psora; and, when applied by friction to the stomach, to be taken up by the absorbents, and act as an aperient and an anthelmintic. By adopting the precautions already suggested, it might not improbably be rendered equally available for the purposes of Pharmacy; and, as the genus *Jatropha* abounds in species common within the tropics, a careful investigation of their chemical and medical properties merits the attention of scientific residents in the regions which produce them.

14, *Octagon*, *Plymouth*, 29*th April*, 1845.

ON THE GENUS JATROPHA, AND THE JANIPHA MANIHOT, AND LŒFLINGII.

My last paper was occupied with the consideration of the medicinal properties of the Jatropha curcas, one of the commonest shrubs in the West Indies, and the J. multifida, a more ornamental shrub, chiefly to be met with in a state of cultivation. But besides these, many other species are found within the tropics, whose active properties will no doubt be found on trial, to correspond more or less with those already spoken of. Among these may be noticed the J. gossypifolia, known in the English islands by the names of bastard French physic nut, belly-ache bush, and wild cassada, and called by the inhabitants of the Spanish main, Fraylecilla and Tuatua. In all its active properties, this plant corresponds with the J. curcas, and its seeds have been recommended by Dr. Barham, in conjunction with other drastic purgatives, as in the following form:

℞ Pulveris seminum decortic. Jatrophæ gossypifoliæ, ʒiij.
Cambogiæ,
Extracti Colocynthidis,
Pulveris Scammoniæ, aa ʒj. M.F. Massa in pilulas nonaginta equales dividenda. Una, altera, pluresve p.r.n. ad alvi evacuationem aptam, sumenda.

In dropsical affections this would, no doubt, be found extremely serviceable.

Dr. Barham also acquaints us that the young tops and sprouts boiled and buttered, are frequently effectual in producing evacuations in flatulent colic, after every other remedy has failed: the decoction is also employed in similar cases as an injection. It is also given internally in spasmodic colic accompanied by vomiting, allaying, according to Dr. Wright, the irritability of the stomach, and rarely failing to produce an alvine evacuation.

From this striking resemblance of properties, it is not improbable that some common principle pervades the whole genus, capable of being obtained in a detached form, and administered with greater certainty and effect. The plants are so abundant, that little difficulty or expense could be experienced in collecting a sufficiency for experiment, and in the event of success, a new and valuable addition would be made to the scanty list of our imports from the Sugar Islands. The products of the genus Jatropha might be expected to consist of a purgative oil, an inspissated juice or extract, and an alkaloid presenting the active principle in a more concentrated and less perishable form.

Closely allied to the genus Jatropha, and long confounded with it, is the Janipha manihot, or bitter cassada, the farinaceous matter of whose long fusiform roots, constitutes the well known food of the working classes in the tropical regions, and is regarded as a dainty even by some of the higher classes, under the name of cassada or cassava bread.

The roots of this plant, which hardly admits of botanical discrimination from the Janipha lœfflingii or sweet cassada, notwithstanding the difference of its physical properties, are, in the state in which nature presents them to us, among the most deadly poisons of the West Indies; although we are told that if eaten along with the clay, in which they grew, adhering to them, pigs may devour them with impunity; but after having been washed, they are as fatal to pigs as to human beings. Popular opinions, however supercilious wisdom may affect to deride them, should not be suffered to pass without examination by the practical philosopher, and will frequently be found to rest upon substantial facts. What then is the principle, whose noxious activity admits of being thus neutralized? or is the whole to be added as a fable to Brown's celebrated list of vulgar errors? The existence of an active poison in the recent roots, is a fact, however, which does not admit of dispute, although its nature does not appear to have been ever submitted to the test of chemical inquiry. If I may judge from the effects I experienced myself upon one occasion, I should class its operation with that of morphia, hydrocyanic acid, and other narcotics: at least, the instantaneous relief which followed the application of a cataplasm of the rasped roots, with all their juices unexpressed, to the spot from which a nest of chigres (*Pulex penetrans*) had been dislodged, hardly admits of explanation in any other way. It appears to possess great volatility, or else to be most readily decomposed by heat—since the thin flat circular cakes, resembling Scotch bannocks, which are prepared from the rasped roots after the juice has been expressed, are not only innocuous, but eminently nutritious. Does the active principle then reside wholly in the juice? and is it removable from the farinaceous constituent of the roots by simple expression? or, is the portion, which adheres to the farina, or enters into its composition, volatilized or decomposed by the heat subsequently employed to bake the cakes? This latter appears improbable, from a statement made by Dr. Barham, who observes, "that he has seen several bad accidents happen to negroes newly come to Jamaica, and strangers to the root, who have eaten of it, only *roasted with its juice*, which hath poisoned them." Here the simple application of heat appears to be ineffectual in depriving the root of its noxious property, while still combined with its juice.

The symptoms of poisoning, which I never had occasion to witness, or experience in my own person, are thus described by Barham:—Pain and sickness of the stomach, swelling of the whole abdomen, violent vomiting and purging, giddiness of the head, coldness and shrinking, dimness of sight, faintings, and death in a few hours. The effect upon the pulse is not noticed; its operation is said to be counteracted by remedies of a stimulant nature, as the pods of the capsicum bruised in rum; the common antidote among the Indians: and Browne informs us that a gentleman, who had been for many years in practice in South America, found that a few grains of salt of wormwood (subcarbonate of potass) taken together soon after the exhibition of the poison, will subdue the most alarming symptoms.

A spirituous liquor called *Cassiri* is prepared from the roots of the bitter cassada by the following process, and, taken in moderation, is regarded as aperient and diuretic. The roots are rasped into a vessel containing a sufficiency of water; the mixture is then made to boil, taking care to stir it well so as to prevent the root from burning. When the water has been evaporated to one half, a pellicle forms upon the surface: the liquor is then drawn off without disturbing the pellicle, into another vessel, and left to ferment.

To obtain the amylaceous matter separate from the poisonous liquor, the grated root is introduced into strong canvas bags of considerable length, and subjected to strong and continued pressure. After the whole of the juice has been thus extracted, the farina is exposed for some time to the sun, afterwards pounded in a large wooden mortar, passed through a coarse sieve, and finally baked on a flat circular plate of iron, about thirty inches in diameter. The weight of these cakes, called *Tortas* in Caraccas, is about three quarters of a pound each, and three of them are sold, according to Humboldt, for one rial of plate, or the eighth of a dollar. At Jovita, a square of fifty feet planted with bitter cassada, called there *Yucca*, yields in two years in the worst soil six tortas of cassada: an equal extent of middling soil yields in the same neighbourhood nine tortas in fourteen months, while, in an excellent soil around clumps of the mauritia palm, the same space of ground yields in twelve months from thirteen to fourteen tortas; and even this produce, large as it appears, admits, no doubt, of being doubled or even trebled by the joint action of electricity and manure. Five pounds weight of the roots yield eleven ounces two drachms of amylaceous matter.

The deleterious principle, whatever be its nature, appears to remain in combination with the liquor which has been separated from the grated root by expression; but along with it a portion of farinaceous matter remains suspended in a state of minute division; this is gradually deposited, and, being separated by decantation from the supernatant liquor, and dried, forms the *tapioca* of the shops, or *farine manioc* of the French colonists.

The liquor which remains, after the separation of the tapioca, is converted into a most incomparable sauce by the inhabitants of Berbice. This sauce, which is sold in Barbadoes under the name of *cassireepe*, is said to be prepared in the following manner:—

The liquor, after having been racked off from the tapioca, is strained and set to boil in an earthen vessel, skimming it during the process of ebullition. When reduced by evaporation to about one half, or to the consistence of a syrup, it is seasoned with a sufficiency of salt and black and red pepper, to which are added, if it is designed to be kept for any length of time, cinnamon, mace, and cloves. The higher the degree of seasoning and inspissation, the longer it is capable of being kept. This is a most incomparable preparation, applicable to a vast variety of purposes in domestic economy. A tablespoonful of what is commonly sold at Barbadoes, or about half an ounce by measure, mixed with a tureen of pigeon-pea soup (soup made with the seeds of the Cajannas luteus, or Angola, or pigeon-pea shrub), a standard dish in most of the British Islands, gives it all the richness and flavour of the strongest beef soup.

In making this sauce the deleterious matter originally contained in the expressed liquor, appears to be thrown up to the surface by the act of ebullition, and separated by skimming. What its nature is, and whether it can be obtained in a detached and portable form, applicable to the purposes of medicines, are questions well worth the labour of investigation.

I have already, from personal experience, noticed the powerful effect of the recent root of the Janipha manihot, grated and applied as a cataplasm, in allaying the intolerable itching which remains after the extraction of the bag of the chigre; and its effect is similar when applied to ill-conditioned ulcers, allaying the irritation, correcting the fœtor, and promoting a healthy granulation. As a dressing for carcinomatous sores, even though it should fail in effecting their cure, it is well worth attention.

The Janipha lœfflingii, so closely resembles the former in its external characters, that it can hardly be distinguished with certainty, by even an experienced eye, and has been considered by Browne, and many other writers, merely as a variety. Its root, however, is wholly destitute of the active principle which renders the bitter cassada, in its unprepared state, an object of such just apprehension. Jacquin speaks of it as attaining a growth of twenty feet in height, a size far exceeding any thing I recollect to have seen. Five pounds of the root yield fourteen ounces one drachm, or nearly one-fifth of their weight, of amylaceous matter.

From the difficulty of discriminating, and the danger which might result from mistaking the one for the other, they are always planted apart—the roots of the sweet cassada requiring no other preparation than simply boiling or roasting; and even admitting of being eaten raw with impunity. Tapioca is obtained in the same manner as from the bitter species, by grating the roots, washing and infusing this in water, and evaporating the liquor so as to obtain the starch, which is afterwards carefully dried in the sun. The term cassada, cassava, or cassavi, applied to these plants, is a Spanish corruption of the original Indian name of Cazabbi.

14, *Octagon, Plymouth, May* 20, 1845.

SEQUEL TO THE ABOVE PAPER ON JANIPHA.

Since the dispatch of the paper on the medicinal and economical properties of the bitter cassada, I stumbled accidentally upon a note in my unpublished *Flora of the Antilles*, which it may not be amiss to submit to the consideration of those who may be disposed to regard the Janipha lœfflingii, or sweet cassada, merely as a variety of the Janipha manihot, resulting from some accidental circumstances in the composition of the soil. I have made no reference to the source from whence my information has been derived, but am inclined to believe that I may appeal to Humboldt as my authority. The following is the note as I find it entered in my manuscript under the head of Dioscorea.

"The ipe (Janipha lœfflingii) is said to show itself in patches in a field, where *only* the mandioca (Janipha manihot *cuttings*) were planted. Does any peculiarity of the soil alter the poisonous nature of the root? Does the mandioca ever appear where *only cuttings* of the ipe have been planted? Does *seed* from the *same* plant indifferently produce ipe or mandioca?"

Such is the entry as I find it in my book, and from the internal evidence of its style, I am more than half convinced it has been transcribed, probably without alteration, from the remarks of the great South American traveller.

The note just given is the sequel of one on the varieties of the Dioscorea bulbifera, or Guinea yam of our English planters, and as it may tend to throw additional light on the subject, I shall now transcribe the former part.

"The cara of Brazil is a variety of the Dioscorea bulbifera, with a white skin, and the tuber somewhat round, but irregular. The term *cara* is likewise frequently given to other esculent roots, especially the Janipha manihot, which is, however, more commonly called ipe; though this term is perhaps *more correctly* given to the Janipha lœfflingii, which is only to be distinguished by the colour of its leaves and stems being less livid, and its root capable of being eaten raw. Much mystery attends these two plants, which can only be solved by sowing *the seed of each*, and not perpetuating the varieties, if *really such*, by cuttings in the common way."

It is somewhat singular that I should never have heard of so remarkable a fact during the long years of my sojourn in almost every part of the West Indies; believing, however, the information to have been derived from so accurate and so inquisitive a source as Humboldt, I cannot for an instant allow myself to question its correctness; and, admitting this, it furnishes much matter for curious and not uninstructive reflection.

Is it not more probable that, in the case which has been related, there was some accidental admixture of sticks of the sweet with those of the bitter cassada, which the close resemblance of their external characters rendered it difficult, if not impossible, for the most practised eye to detect; than that patches of soil should occur so capriciously intermixed in the same field, as to effect a complete change in the physical properties of one plant, while another, of the very same species, growing by its side, intermingling perhaps the fibres of its roots, and drawing its sustenance from almost the same particles of soil, retained all its peculiar and characteristic properties unaltered and even unimpaired? When we call to mind the singularly close resemblance between the two species —a resemblance sufficient to deceive even the most experienced eye—can we hesitate to admit the possibility of this being the correct solution of this apparent mystery?

To bring the matter to a correct examination, sticks taken at the time from plants, the poisonous properties of whose roots had been accurately tested, should be carefully planted so as to exclude the possibility of mistake, and the quality of the produce carefully determined; the nature of the soil should also be subjected to a rigorous analysis; and, after the complete removal of the one crop from the ground, so as to prevent the possibility of any stray fragment being left behind to germinate anew, and perpetuate delusion, sticks of the other, prepared with equal care, should be planted in the same patch of ground, and the results carefully noted.

I am aware, from experience, of the difficulty of procuring the seed of a plant so uniformly propagated by cuttings as the cassada; but as occasional instances must occur of plants being suffered to perfect their seed, and as one or two plants of each sort might, without any very serious loss, be set apart for the purpose, I shall be obliged to any friend within the tropics who will aid me in the solution of this curious problem, by furnishing me with seeds and cuttings of both kinds, carefully selected and accurately labelled.

14, *Octagon*, *Plymouth*, 21*st May*, 1845.

MEDICAL PROPERTIES OF THE FEVILLEA CORDIFOLIA.

BY W. HAMILTON, M.D., PLYMOUTH.

Among the other indigenous productions of our West Indian colonies, which the superior attractions of the cane have hitherto kept in unmerited obscurity, the Fevillea cordifolia, or Antidote Coccoon, claims a prominent place from the value of its medicinal properties.

This is a climbing plant, frequent in waste lands and on the skirts of woods, covering the trees and bushes like ivy, and producing small yellow flowers, which are succeeded by a hard three-celled pome, resembling a calabash, and inclosing about a dozen large round compressed seeds, which, on attaining maturity, drop out through a circular opening in the fruit. These seeds are known by the name of coccoons, and, from the quantity of oil which they contain, are employed by the negroes as a substitute for candles; a number being stuck for this purpose on a long skewer, and the uppermost coccoon ignited.

The whole plant abounds in a bitter principle, which might, no doubt, be advantageously substituted for some of the more costly bitters of the shops; and this bitter principle obtained, in the present improved state of chemical science, in a detached and portable form. Popular opinion accords to the plant itself the merit of being antisyphilitic, emmenagogue, and stomachic. But the bitter principle which pervades all the other parts of the plant, presents itself in a still more concentrated form in the seeds or coccoons, which have, in consequence, been chiefly, if not exclusively, employed in the rude practice of our colonies.

Such is the estimation in which they are held by the Spanish inhabitants of South America, to whom they are known by the name of *avila*, or *avilla*, that they are reputed by them to be worth their weight in gold; and in Brazil, the oil obtained from them by expression, is regarded as a sovereign remedy for those rheumatic pains which result from exposure to the cold and dews of night.

The tincture is prepared by macerating eight or ten of these coccoons, scraped and bruised fine in a mortar, in a pint of spirit for two or three days, shaking the bottle containing them frequently, and diluting the tincture with an equal quantity of water. This tincture, in doses of a tablespoonful, is a good stomachic, and counteracts the effects of poisonous fish. According to a numerous series of experiments made by Mr. Drapier, of which an account may be found in the nineteenth number of the *Quarterly Journal of Science*, p. 192, these coccoons are most powerful antidotes to vegetable poisons; and he has found their external application to poisoned wounds equally efficacious.

Of the efficacy of the tincture, prepared in the manner just mentioned, as a hydragogue in the cure of anasarca, a striking case was communicated to the *Columbian Magazine*, for July 1798, by a gentleman who had an opportunity of witnessing its effect upon a female domestic of his own, who had, as he informs us, "been pronounced by the medical gentlemen in Spanish Town, in a dropsical state, and every thing administered that they thought necessary in such a case, but all in vain; for, on my subsequent removal to Kingston, I found the swelling much increased in her face, legs, and thighs, with a puffiness in her belly. A planter, from Above Rocks, breakfasted with me; I called the girl to get some water; he was alarmed on seeing her condition, and advised the use of the coccoon or antidote, observing that he had made a perfect cure of a girl in the same state. I proceeded according to his directions, and with the like success; it is now eighteen months since, and thanks be to God, she is now in perfect health. I therefore think myself bound to publish the same for the benefit of my fellow-creatures."

Such is the unvarnished narrative of the anonymous correspondent of the magazine, which is not the less entitled to consideration, because it comes unsanctioned by the impress of professional authority, and unauthenticated by the celebrity of a name. To the medical reader, the omission of the manner of exhibition is immaterial, since his own experience and judgment in similar cases must be sufficient to guide him, while his professional caution will secure him against the danger of its rash administration.

It becomes, however, worth the trouble of enquiry to determine upon what the hydragogue action of the coccoons depends, and whether the active constituent does not admit of being obtained apart from the rest. By the aid of Chemistry, modern practice is enabled, in most cases, to reduce the bulk, while it augments the activity of the dose. This is especially manifested in the cases of cinchona and opium—in both of which art has succeeded in detaching the active principle from its inert or noxious adjuncts, and presenting it to the patient in a form, if not attractive, at least exciting the smallest possible amount of disgust.

Taken to a larger extent than that mentioned, the tincture operates as an emetic and a purgative. In dropsical cases a wineglassful should be taken every morning fasting, and followed by moderate exercise before breakfast. An infusion in Madeira wine is also a good stomachic. The expressed oil of the coccoon is good for burning, and may perhaps prove useful as an internal remedy in the same cases in which the tincture has been recommended; and from partaking of the same bitter taste with the seeds, it is probable that the same active principle may be found to pervade the whole plant.

14, *Octagon*, *Plymouth*, *May* 21, 1845.

ANTIDOTE TO PRUSSIC ACID.

BY MESSRS. T. AND H. SMITH.

Some time since, an antidote to the poison of prussic acid was made known to the public by us, through the medium of the *Lancet*, of 5th October last. Subsequently, Professor Christison, Mr. Taylor, and other eminent toxicologists, have sanctioned with their approval the principle of the proposed antidote, which, when tried on animals, proved so strikingly successful. It need only be repeated here, that the utility of the remedy rests on the presentation to the deadly acid of iron in such a state of oxidation, as to form with it the well-known compound called Prussian blue; and as the latter is innocuous to the stomach, animal life may be preserved wherever such a combination of the acid with the iron can be timely formed. In suggesting this process, we claim only the merit of having noticed the necessity for presenting the iron in a double state of oxidation—of protoxide and peroxide—along with an alkaline carbonate, and of having made known a method for using the same as a remedy, safely, practically, and effectually.

As cases of poisoning by prussic acid are becoming, unfortunately, more and more numerous, it has occurred to us that a simpler, though certainly inferior mode of using the remedy proposed by us, might have a chance of being more frequently available. By the first method, the antidote would require to be prepared and kept in readiness, by practical chemists and medical men. The plan which we are about to propose renders this less urgently necessary. The materials for the antidote are among the most common articles of every laboratory or drug shop.

The English medical practitioner, who lately fell a victim to prussic acid, and who lived *twenty minutes* after being seen by his brother and partner in business, would in all human probability have recovered, had the following remedy been known and used—since the parties were in their own house, and had a laboratory close at hand. The materials required to form the antidote, are sulphate of protoxide of iron or green vitriol, tincture of the muriate of iron, and carbonate of potash, or the ordinary salt of tartar of the shops. The principle is the same as that first stated—the presentation, namely, of the protoxide and peroxide of iron to the prussic acid, in the presence of an alkaline carbonate, so as to cause its neutralization, but in a different way. We will now endeavour to explain how and in what proportions the different substances, composing the antidote are to be used, so as to secure the end aimed at.

As according to Phillips' observations as well as our own, one fluid ounce of the tincture of the muriate of iron contains about thirty grains of peroxide of iron, one drachm must contain very little less than four grains; and as the Prussian blue resulting from the action of the antidote is composed of two equivalents of sesquicyanuret of iron, and three equivalents of protocyanuret,

$$3\ \mathrm{Fe\ Cy} + 2\ \mathrm{Fe_2\ Cy_3}.$$

two equivalents of the sesqui or peroxide $80 \times 2 = 160$ with the proper quantity of a protosalt of iron, will separate nine equivalents, or 226.51 of prussic acid;

$$\text{thus H Cy 1 equivalent} = 27.39 \times 9 = 246.51.$$

Taking as the basis of our calculation the quantity of peroxide of iron contained in tincture of muriate of iron, it will be found by the rule of proportion, that one drachm of the tincture, containing four grains, will neutralize 5.6 grains of real or anhydrous prussic acid, or 280 grains of the strength prescribed by the London College, thus

$$160 : 246.51 :: 4 : x = 5.6.$$

The relative quantity of sulphate of the protoxide of iron, or green vitriol, can also be learned by proportion, for as two equivalents of peroxide of iron are united to three equivalents of protocyanuret of iron, to constitute Prussian blue, every two equivalents of a peroxide of iron in solution must be mixed with three equivalents of a protoxide of iron also in solution; and as the equivalent of protosulphate of iron is 130, three equivalents will be 390, calculating from these figures, it will be found that four grains of peroxide of iron will require 9.75 grains of green vitriol, for

$$160 : 390 :: 4 : x = 9.75.$$

In the same way the correct quantity of salt of tartar, or carbonate of potash, may be found. The equivalent of this is, in round numbers, 70, of which nine equivalents must be present, along with the prussic acid to seize the nine equivalents of the strong acids, sulphuric and muriatic, contained in the mixed iron salts, to allow the prussic acid to take their place. The affinity of prussic acid for iron, is not of itself sufficient to effect this result, but the two affinities—that of prussic acid for iron, and sulphuric and muriatic acids for the alkali—acting in concert, do so at once. Nine equivalents being $70 \times 9 = 630$, four grains of peroxide of iron will require 15.7 grains carbonate of potash, thus

$$160 : 630 :: 4 : x = 15.7.$$

According to the above calculation, one drachm of tincture of muriate of iron and 9.75 grains of green vitriol in solution, on being added to a liquid, containing 15.7 grains of carbonate of potash, can separate prussic acid from that liquid if present, whether in an open vessel or in the living stomach, to the extent of 5.6 grains; but in fact, it will be found that an amount equal to that is not separated. This is readily understood, when it is recollected that the common carbonate of potash is a very deliquescent salt, and further, that it is by no means pure; and besides this, the tincture of muriate of iron contains an excess of acid, which, with the alkaline carbonate will form chloride of potassium, which has no affinity for the prussic acid, but must have the effect to the extent of the quantity formed, of diminishing the amount of carbonate really effective in precipitating prussic acid. The practical result of these various disturbing causes, is, that on precipitating the prussic acid by the method above explained, from a liquid containing the acid in considerable excess, the Prussian blue, separated by filtration and converted into peroxide of iron, weighed, after ignition, instead of seven grains, only one-third of that number. So that instead of 5.6 grains of anhydrous prussic acid being removed, the real quantity was only a third of this; but it must be kept in mind, that if a quantity of acid exceeding that should be taken, it is but too probable that the unhappy individual would perish too quickly to allow of any means whatever being used. To make up to a certain extent for the moisture and impurities of the salt of tartar, instead of using 15.7 grains, which is the correct quantity when in a pure state, twenty grains should be used. We would not recommend more than this, as an excess of alkali would so far prevent or redissolve the precipitate, causing the production of prussiate of potash; which, although it has been found to have no poisonous action on the human body, yet it seems better that the poison should be separated in an insoluble form.

To render our meaning more precise and clear, and less likely to be misunderstood, we will briefly state the course which we think ought to be adopted. On the one hand, dissolve ten grains of sulphate of protoxide of iron, or green vitriol, in an ounce of water, using a mortar to hasten solution, and adding one drachm of the tincture of muriate of iron. Put this liquid into a phial, and in another phial dissolve twenty grains of carbonate of potash, or, according to its common name, salt of tartar, in another ounce or two of water, and to prevent delay—the serious consequences of which cannot be too strongly impressed on the mind, as every moment bears a swift message of life or death to a human being—dispense with labelling, and let the person who prepares the antidote, if possible, go at once and give it himself.

The action of the antidote forms of itself a very pretty and interesting experiment, which may be shown in the following way:—Dissolve in one glass, containing a little water, eight grains of carbonate of potash, adding twenty or thirty drops of medicinal prussic acid, and in another glass, five grains of green vitriol in half an ounce of water, adding half a drachm of tincture of muriate of iron. Mix the two liquids together. As there is too small a quantity of prussic acid present to convert the whole of the iron into Prussian blue, the colour of this is masked by oxide of iron thrown down at the same time; but on adding a sufficient quantity of a strong acid, such as nitric acid, to dissolve the oxide of iron, as Prussian blue is not soluble in the acid, it remains displaying its strikingly beautiful and characteristic blue colour.

Edinburgh, May 20, 1845.

ON POTATO SUGAR.

BY MR. JOHN A. SPENCER.

WISHING a short time since to prepare a specimen of grape sugar from potato starch, and not feeling satisfied with the product obtained by the use of oil of vitriol, in consequence of the sulphate of lime retained in solution, it struck me that if I used an acid whose lime-salt was more insoluble than the sulphate the product would be improved; I therefore used oxalic acid, and was not disappointed in my expectation.

Four parts of potato-starch, twenty parts of water, and one part of oxalic acid, dissolved in water, were boiled together, and in less than ten minutes the mixture, from being so thick, that the vessel which contained it might have been inverted for a few moments without risk of loss, became as thin and limpid as water; the boiling was continued until a small portion of the liquid, neutralized with chalk and filtered, gave NO precipitate with a solution of diacetate of lead, which occupies in general from five to six hours.

The liquid was then neutralized with chalk, boiled and filtered—the filtered solution digested with animal charcoal to deprive it of what little colour it had acquired, again filtered, and the washings of the charcoal added to the solution, which was then evaporated in a water-bath to the consistence of honey, and placed in a warm situation for three or four days, when the whole solidified into a crystalline mass of grape sugar, having a perfectly sweet taste, unaccompanied by any bitterness, while that made with sulphuric acid had a nauseous bitter taste, and crystallized with much greater difficulty.

In addition to the superiority of the product obtained by this process, we have the great advantage of being able to ascertain when the whole of the starch has been converted into sugar, by its giving no precipitate with a solution of diacetate of lead, which shows that the dextrine, into which the starch is first converted has undergone its complete change, and enables us to avoid unnecessary boiling, which destroys its tendency to crystallize, an advantage not afforded by the use of sulphuric acid, because the sulphate of lime retained in solution (however small in quantity) precipitates sulphate of lead, which, though very different in appearance to the compound of gum and oxide of lead, might be mistaken for it in small quantities.

Since adopting the above process, I find that Mr. Graham, in his *Elements*, suggests the use of $\frac{1}{200}$ part of oxalic acid, but I have not been able to succeed with anything like so small a quantity.

A mixture, in the proportions prescribed by Mr. Graham, was boiled for fourteen hours and a half; but the liquid, though much discoloured, was not even made limpid, far less was its property of forming the blue compound, with a solution of iodine, destroyed.

If in time the starch should be converted into sugar, I think its tendency to crystallize would be completely destroyed by the long boiling required.

38, *Lamb's Conduit Street, June* 5, 1845.

Mr. FOWNES said, he had listened with pleasure to the paper which had just been read. It was from the pen of one of the pupils, to whom a certificate of merit had been given that evening in the class of Chemistry. He had examined some of the grape sugar made by Mr. Spencer's process, and he thought it much better than that made with sulphuric acid. The process was evidently a very good one.

ORIGINAL AND EXTRACTED ARTICLES.

ANALYSIS OF THE ASHES OF CONIUM MACULATUM AND DIGITALIS PURPUREA.

BY MR. F. C. WRIGHTSON (OF BIRMINGHAM).

No one at the present day denies that the mineral constituents of plants play a most important part in their growth and development, and although from the comparatively small number of ash analyses we at present possess, we are unacquainted with the precise mode of action of each, yet we have learnt, that to certain classes of plants, certain of these inorganic constituents, and in definite proportions, are absolutely indispensable; a fact, the importance of which is every day becoming more apparent.

Perhaps, if attention were turned towards those classes of plants which afford us medicinal re-agents, the labour would be repaid; at all events, it could not be thrown away, for the ash analysis of the simplest weed that grows, must contribute, more or less, to an elucidation of the functions of these inorganic constituents.

I selected the above plants for analysis whilst working in the Giessen laboratory, from having had frequent occasion to remark the large quantity of chlorides which the fresh expressed juices of these plants contain. If, after separating the albumen by heat from the juice, it be rendered slightly acid by nitric acid, and then a few drops of nitrate of silver solution added, a copious curdy precipitate of chloride of silver (soluble in ammonia) is thrown down. This is the case in the juices of all the narcotic plants, but especially in the Conium maculatum, Hyoscyamus niger, and Atropa belladonna.

Some plants which were grown near Giessen, when examined qualitatively, appeared to afford much the same results to those of which I give the quantitative analysis; and which I obtained from England. The method of analysis pursued, was that lately published by Drs. Will and Fresenius.

CONIUM MACULATUM.

Determination of the per centage of ash—1,624 grammes of the leaves dried at 100° Centigrade when burnt nearly to whiteness, left a residue of 0.208 ash=12.80 per cent. Much ammonia was given off during the burning. The qualitative analysis indicated the presence of earthy phosphates.

Direct per Centage found.	
Carbonic Acid	13.68
Carbon and Sand	4.87
Silica	2.11
Chlorine	8.10
Peroxide of Iron	1.25
Lime	20.02
Magnesia	6.78
Phosphoric Acid	9.11
Potash	17.52
Soda	14.95
Sulphuric Acid	2.78
	101.17

Reckoned composition per cent. of the Ash, after deducting Carbonic Acid, Carbon, and Sand.	
Silica	2.62
Chloride of Sodium	16.61
Phosphate of Peroxide of Iron	3.49
Phosphate of Lime	16.77
Sulphate of Lime	5.88
Lime	14.91
Magnesia	8.39
Potash	21.69
Soda	9.64
	100.00

It will be perceived that the excess obtained in the analysis is due to the soda being determined and reckoned as an oxide, whilst we must suppose it is a chloride in the ash. If we deduct 1.82 the proportion of oxygen equivalent to 8.10 chlorine, it leaves 99.35 the true per centage found by analysis.

DIGITALIS PURPUREA.

Per centage of ash—1.313 grammes of the leaves dried at 100° Cent. when burnt to whiteness, left 0.143 ash = 10.89 per cent. Much less ammonia was perceptible whilst burning. The qualitative analysis indicated very little earthy phosphates.

Direct per Centage *found*.	
Carbonic Acid	13.15
Chlorine	4.09
Carbon and Sand	10.94
Oxide of Iron	1.46
Silica	9.58
Sulphuric Acid	2.84
Phosphoric Acid	2.39
Lime	11.82
Magnesia	4.90
Potash	32.64
Soda	6.39
	100.20

Reckoned composition per cent. of the Ash, after deducting Carbonic Acid, Carbon and Sand.	
Silica	12.78
*Phosphate of Peroxide of Iron	4.63
Phosphate of Lime	0.44
Sulphate of Lime	6.69
Lime	12.67
Magnesia	6.53
Chloride of Sodium	9.03
Potash	43.53
Soda	3.70
	100.00

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* The phosphate of iron is reckoned according to the analysis given by Will and Fresenius, which shows its constitution to be basic, $2\,Fe_2O_3 + 3\,PO_5$.

Deduct 0.92, the quantity of oxygen corresponding to 4.09 chlorine, from 100.20, and 99.28 remains, the per centage given by analysis.

The quantity per cent. of nitrogen contained in these plants is remarkable.

In two analyses by Dr. Wills' method, I obtained the following results:

CONIUM MACULATUM.

Of the leaves dried at 100° Cent., until no further decrease was perceptible, 0.1058 grammes was taken, from which, when 0.0135 the proportion of ash found, is deducted, there remains 0.0923.

On burning with natron[†] kalk the quantity of carburetted hydrogen with excess of carbon, which came over into the acid apparatus, was so great as to render the determination of nitrogen as platin salmiak impossible. The platin salmiak obtained, was therefore enveloped in its filter, and burnt with the necessary precautions. The platina thus obtained weighed .0445, 100. platina corresponds to 14.25 nitrogen; therefore 100. : 14.25 : 0.0445 : : .00634 nitrogen—As .0923 of the plant was burnt, this gives 6.86 per cent. nitrogen.

In an analysis of the ash of Atropa belladonna (which was not completed, owing to an accident which happened towards the close of the session), the quantity of chlorine found per cent. was 8.64, nearly the same as in the conium.

The nitrogen was also determined and gave 6.28 per cent.

ON YEAST,

WITH REFERENCE TO THE PHENOMENA OF FERMENTATION.

BY DR. T. SCHLOSSBERGER.

Stahl, in his *Zymotechnia Fundamentalis*, published in the year 1734, observes, that " a body in a state of putrefaction very readily communicates the action going on within itself to another body as yet free from all signs of putrefaction. Thus a body in a state of *internal commotion* has a tendency to *produce* a similar commotion in others, yet in a state of quietude, but by nature prone to such action. By putrefaction, animals are frequently generated and propagated; one of the causes of which phenomenon appears to be that an internal commotion takes place during the process of putrefaction, and that this is communicated to the ovules, calling the animals they contain into life." We here detect the germ of a theory which was totally lost to science for more than one century, until it was recently again discovered by induction, and clearly exemplified by *Liebig*. *Lavoisier* speaks, indeed, of a destruction of equilibrium in the attraction of the elements of sugar by a ferment, but does not venture to explain it on known principles. Thus it remained for Liebig to discover the cause, in the well known fundamental law of modern mechanics. (Vide *Liebig's Agricultural Chemistry*, on the communication of motion from one molecule to another). Liebig has substituted in lieu of catalytic power, and the contact theory (evident circumscriptions of facts or acknowledgments of our ignorance) an elegant theory, which has already thrown great light on the most obscure processes of organic, and more especially physico-pathological, chemistry. We are also indebted to him for a new theory of contagion, miasma, and the so called septic poisons. According to this new theory, yeast became the subject of chemical research, as the type of all substances in a state of spontaneous decomposition, and capable of communicating this action to others (of disturbing the equilibrium of the atoms in compound bodies) because it was the substance most readily obtained and best suited for analysis. The microscopic observers, *Schwann*, *Cagniard de la Tour*, *Kuetzing*, *Quevenne*, &c. soon directed their attention to the same subject and discovered the globules of yeast, declaring them to be organic structure in its simplest form, discoveries calculated to give the doctrine of *organic cells* in their *most simple and original form* an empirical foundation. These conclusions arrived at as the results of chemical and microscopical observation met with much opposition as they were considered contradictory; many Chemists, amongst whom was Berzelius, objecting to the microscope altogether, whilst an anonymous satire caricatured the hunters after *fungi* and *infusoria*. Other physiologists again, saw in the organic nature of the globules of yeast, a decisive argument against Liebig's theory, forgetting that the generation or development of microscopic plants and animals might expedite or modify the process of decomposition, without necessarily being its first cause. If continued assimilation and secretion, destruction and reproduction, be the characteristics of material life, why should we be surprised at finding these properties, in a marked degree in primary cells, the very prototypes of organization? The incontestible and very intelligible fact of organic formation in the process of fermentation and putrefaction can only be an object of dispute when the question is mooted, Whether these organic productions are to be regarded as merely accidental, and exerting no further influence on the mentioned processes, or whether they stand in such connexion with them as to deserve to be regarded as chief cause? To settle this question, however, more observation than science at present furnishes us with are required; and, above all things, a thorough examination of yeast, as the product of fermentation, most readily to be obtained pure and in large quantities, became a desideratum, and to endeavour to furnish this is the object of this present paper.

[†] It may here be stated, for the information of readers unconversant with chemistry (*the fact?*) that all organic bodies containing nitrogen (excepting when it is in the state of oxide, *i. e.* as NO 2, NO 4, &c.) when burnt at a red or white heat with hydrated alkalies, are so decomposed, that the *whole* of the nitrogen combines with the hydrogen of the hydrate water, whilst the oxygen of the latter oxidizes sufficient of the carbon of the organic body to combine with the base, and form a carbonate.

In the examination of yeast (if we may so term the cells arrested in a certain stage of development, or at a certain period of transposition of their elements when deprived of their power of exciting fermentation) the portion of yeast at the upper part, and that from the lower part of the vessel was used, as no chemical difference could be detected even microscopically, between the two. The impure yeast, mixed with the remains of beer, hops, &c. (but containing no amylum), was first mixed with water, and allowed to stand; the sediment thus obtained was pressed through fine linen until it was nearly white, and the water remained free from taste and colour; this process of filtration considerably expedites the purification, as the small cells of yeast pass readily through the interstices of the linen, which retains the smallest particles of mechanical admixture. The process of washing should be carried on as speedily as possible, as yeast is a substance which rapidly undergoes change, and, when the sugar is dissolved in washing, easily passes into a state of putrid fermentation. The water used contained the constituents of beer, a free acid, and always salts of ammonia. The insoluble residue, in which the microscope detected the spherical and elliptical cells of yeast, with a very few small black points, was now washed with cold and hot spirit until the latter remained colourless; the first alcoholic extracts were of a deep yellow colour, and contained resin, a bitter extractive (from the hops); fluid and solid fatty matter. Boiling ether now extracted a small quantity of a yellow oil. The yeast cells, thus purified, presented at 212° Fahr. the appearance of white flour without taste or odour, and the cells themselves seemed to be but slightly changed in size, and many small granules were visible in them which before had been scarcely perceptible; this granular appearance may always be produced in fresh yeast by potash or acetic acid. Potash and acetic acid extracted a substance resembling proteïne, but left the membrane of the cells unchanged, but by boiling for some time with a caustic solution of potash a perfect solution was obtained from which sulphuretted hydrogen was evolved on addition of the acids. Concentrated sulphuric acid produced a brown colour with the substance, and subsequently dissolved it, forming a brown solution. This substance had of course lost its power of producing fermentation entirely; exposed in an open vessel, with water, it decomposed slowly, and with the gradual destruction of the cells numerous *infusoria* were developed, although I failed in repeated trials to convert sugar into alcohol with this decomposing substance.

The elementary analysis of the globules of yeast had hitherto been totally overlooked, or the few analyses to be met with on record are quite contradictory, thus those of Marcet, and of Dumas, and Mitscherlich, by no means coincide. This difference in the opinion of such distinguished chemists rendered an elementary analysis of the globules as primary cells interesting, although in the course of the examination the globules proved to consist of at least two substances.

(*To be continued.*)

ON VEGETABLE MUCILAGE AND BASSORIN.

BY DR. C. SCHMIDT.

The author after referring to Mulder's examination of the vegetable mucilages, observes, that in general, the indifferent substances, sugar, gum, starch-meal, woody fibre, mucilage, bassorin, and pectine, have been in modern times arranged in two principal groups, which are of great importance in vegetable physiology, viz.

1st. Such as contain *carbon* plus *hydrogen* and *oxygen* in the same relative proportion as in water. These he terms *hydrates of carbon*.

2dly. Such as contain *more or less oxygen*, that is sufficient to form with hydrogen, water.

To which of these groups does vegetable mucilage and bassorin belong? Mulder refers them to the second, Schmidt to the first.

The author then enters into an elaborate examination of the following mucilaginous substances, viz., *tragacanth*, *cherry-tree gum*, *salep*, *quince mucilage*, *mucilage of fleawort seed*, *linseed mucilage*, *mucilage of several species of salvia*, *althæa mucilage*, *mucilage of symphytum root*, *and gelatinous matter of sea-weeds*. The following are his numerical results:—

ANALYSES OF THE VEGETABLE MUCILAGES.

I. *Where insoluble cellular membrane is mixed with the gum.*

	a. Entire tubers of Salep.		*b. Impure Tragacanth.*	*c. Pure Tragacanth.*	
	I.	II.		I.	II.
Carbon	45.17	44.96	45.63	45.33	45.10
Hydrogen	6.34	6.32	6.00	6.16	6.27
Oxygen	48.49	48.49	48.37	48.51	48.63

II. *Where the cellular membrane swells in the solution with the gum.*

	a. Carrageen Moss. I.	II.	*b. Quince seed Mucilage.* I.	II.	*c. Fleawort seed Mucilage.*	*Linseed Mucilage.* I.	II.
Carbon	44.70	44.86	45.04	45.30	45.33	44.97	44.77
Hydrogen	6.29	6.25	6.15	6.22	6.24	6.26	6.21
Oxygen	49.01	48.89	48.81	48.48	48.43	48.77	49.02

III. *Pure contents of the cells.*

Mucilage of Althaea.

	I.	II.
Carbon	44.88	44.70
Hydrogen	6.29	6.25
Oxygen	48.83	49.05

IV. *Cellular membrane pure.*

Residue of Salep.

	I.	II.
Carbon	47.20	47.28
Hydrogen	6.10	5.94
Oxygen	46.70	46.78

V. *Gum obtained by Acids.*

	a. Gum Tragacanth. I.	II.	*b. Cherry-tree Gum.* I.	II.	*c. Salep Gum.* I.	II.
Carbon	44.68	44.57	44.72	44.55	44.68	44.57
Hydrogen	6.27	6.22	6.21	6.33	6.27	6.24
Oxygen	49.05	49.21	49.07	49.12	49.05	49.19

Starch-meal=$C_{12}\ H_{10}\ O_{10}$ contains in 100 parts C. 44.72, H. 6.14, O. 49.14.

Gum dried at 356°=$C_{12}\ H_9\ O_9$ contains in 100 parts:

Carbon	47.34
Hydrogen	5.85
Oxygen	46.81

(Atomic weight of the carbon throughout=75.854, of the hydrogen=12.5.)

The result of these analyses would tend to prove that starch-meal or gum= $C_{12}\ H_{10}\ O_{10}$, is, as it were, the proteine of the hydrates of carbon of the substances which, in conjunction with a larger or smaller quantity of salts (salts of lime, phosphate of lime), form, among other matters, the so-called vegetable mucilages of Chemists, whose characteristics are modified by the quantity and quality of the salts they contain.

We see this substance $C_{12}\ H_{10}\ O_{10}$, call it starch-meal or gum, or by any other name, form grape sugar, by adoption of the elements of water; or lignine, by loss of those elements; the former the most changeable, the latter the most constant link of this series. Between the two, the most variable transitions take place, according to the development of the cells.

As transitions of gum or starch-meal to lignine, we must consider the so called mucilages, bassorine, cerasine, prunine, &c.

By the gelatinous appearance of a substance, we can form no conclusion as to its constitution. Whoever attaches importance to the arrangement of atoms, should remember, amongst other instances, the identity in the composition of blood, muscle, &c.

During the development of the cellular tissue of plants, this and numerous similar transitions must take place, and might be demonstrated in the cambium cells of our trees in spring.

Pectine does not appear to be so extensively diffused as it was supposed to be, probably in consequence of the arrangement of its atoms.

If we accustom ourselves to look on these, and a hundred other hydrates of carbon as links of a continuous chain, at the one extremity of which is sugar, and at the other lignine, it will be ridiculous to fabricate new names, such as epidermose, cellulose, lignine, &c., or the cellular membrane of different plants must be individually specified as quercose, fagose, pinose, &c., and different names must be found for the secondary deposits, the fluid contents of the cells, the granules suspended in them, &c., in each individual plant.—*Annalen der Chemie und Pharmacie*, Band li., Heft 1.

SCAMMONY BISCUITS.

The late Dr. Jos. Baader, who was towards the end of the last century one of the most successful medical men in large practice at Munich, ordered, when he wanted a drastic purgative, scammony resin in various combinations, in preference to other remedies. It is adapted for use in many cases, more especially as it has not the nauseous taste of jalap resin.

Scammony resin is prepared by digesting repeatedly powdered Aleppo scammony in alcohol, and precipitating the resin by means of water, as jalap resin is obtained from tincture of jalap. When dry, the resin is friable, transparent, and very soluble in spirit. If we drop a saturated solution on biscuit, the fluid is immediately absorbed, and thus forms a very good preparation for children. Dr. Warenner observes, in the *Medico Chirurgical Journal*, that Dr. Baader ordered a biscuit for adults, to which he had added sapo medicatus, and prepared according to this recipe :—

℞ Scammoniæ, ʒj.
Saponis Venet., gr. v.
Sacchari albi, gr. ix. M.

These ingredients were to be rubbed down to a fine powder, and mixed with one ounce of powdered biscuit. The mass was then to be kneaded with the aid of a few drops of water to a stiff paste, which was dried in the air, and weighed out into portions of ʒx. Of this mass ʒj. contains gr. vj. of scammony resin. Scammony resin is not unpleasant to take, rubbed down with sugar. Eight grains of the resin are sufficient to produce several evacuations in an adult; six grains are sufficient for an individual of about fifteen years; four grains for a child of seven or eight years; two grains for a child of two years. Scammony is one of the best anthelmintics.

The above-mentioned powder is still sold in the shops at Munich, by the name of Baader's aperient powder.—*Repertiorum für die Pharmacie.* Band xxxvii., Heft 1.

ON THE VEGETABLE SUBSTANCES FROM THE EAST EMITTING THE ODOUR OF MUSK.

BY X. LANDERER OF ATHENS.

The *Sumbul Root* (musk root) which has recently been introduced into the market, and is the root of an umbelliferous plant, is characterised by a strong odour of musk. I have recently received some information respecting the vegetable substances with a musk odour in use in the east, from Salonika and Constantinople, which I beg leave to communicate.

The oriental medical men use a number of vegetable substances with a powerful odour of musk in their various compounds. The pilgrims on their return from Mecca generally import, among other articles of trade, plants with a musk-like odour for sale. A short time ago I received a few leaves from Jerusalem, with so powerful an odour of musk that they quite impregnated the wardrobe in which I placed them with their perfume. The preparation of these vegetable substances is said to be a secret among the Hakims, and is effected by smearing them over with musk balsam; but I could not learn whether this balsam is prepared by digesting musk in spirit, oil, or ether. I have now in my possession a root from Constantinople, with a strong odour of musk, which appears to be that of an Iris. If I digest this root several times in spirit, I can deprive it of its odour, and if I then pour ammonia over it, the musk odour is again restored.—*Repertorium für die Pharmacie,* Band xxxvii., Heft 2.

ON GUM ARABIC.

BY X. LANDERER, OF ATHENS.

Gum Arabic is collected by people employed for that purpose in the pay of the Egyptian government, and is conveyed by caravan to Cairo, where it remains in the government warehouses. Large cargoes are occasionally sent to Alexandria, to be sold in lots by auction. The annual return amounts to 10 or 20,000 cwt., reckoning the hundred weight at 78lbs.—*Repertorium für die Pharmacie*, Band xxxvii. Heft 2.

EXTRACT FROM THE MEDICAL BILL ABOUT TO BE PASSED IN QUEBEC,

Entitled "*An Act to regulate the Study and Practice of Medicine, Surgery, and Midwifery, within this Province.*"

Qualification of persons to be licensed to sell Drugs and Medicines. Examination of such persons.

"VIII. And be it enacted, That no person shall, from and after the passing of this Act, receive a Licence to sell drugs or medicines, as a Druggist or Apothecary, within any city or town corporate in this Province, who shall not have served a regular and continued apprenticeship of at least three years with some Medical Practitioner or licensed Druggist or Apothecary, and have attended at least one course of lectures on Chemistry, and one course of lectures on *Materia Medica* (each of the duration of at least six months, and each consisting of at least lectures) or, in default of attendance on such courses of lectures, who shall not have served a regular apprenticeship with some Medical Practitioner or licensed Druggist or Apothecary, during the period of at least five years, or who shall not, in either case, have undergone a satisfactory examination, touching his knowledge of the qualities, characters, and effects of drugs and medicines, before one of the Medical Boards hereinafter mentioned, under like formalities and on like conditions as are by this Act required for persons applying for a Licence to practise Physic, Surgery or Midwifery."

The practice of medicine or the selling of drugs without a licence to be a misdemeanor. Limitations of prosecutions. Proviso as to surgeons, &c., in the army or navy, on full pay.

"IX. And be it enacted, That the practice of Medicine, Surgery, or Midwifery within this Province, for hire, gain or lucre, or hope of hire, gain or lucre, or the selling of any drugs or medicines within any city or town corporate, as a Druggist or Apothecary, by any person not having a Licence, or not specially excepted, shall be deemed and considered to be a misdemeanor and may be prosecuted and punished as any other misdemeanor may be; and every act of so practising on a separate day shall be a separate offence; and upon the trial of any person charged with such misdemeanor, the burthen of proof as to the Licence or right of the person tried, to practise Medicine, Surgery or Midwifery in the province, shall be upon the defendant; but no prosecution shall be commenced for such misdemeanor after three months from the commission of the supposed offence, and no person convicted of such misdemeanor shall be sentenced to a longer period of imprisonment than three months, nor to a greater fine than pounds, nor to a less fine than pounds, currency; Provided, always, that nothing herein contained shall extend or be construed to extend to prevent any Physician or Surgeon, or other Medical Officer, of her Majesty's Navy or Army, on full pay, from practising as such, while stationed within the said province, and actually employed in the said Navy or Army."

TO CORRESPONDENTS.

R. O. B. suggests, that the time ordered in the London Pharmacopœia for macerating squill bulbs in making the acetum scillæ, is not long enough; in corroboration of which, he sends a sample of extract prepared from the dregs by a second maceration.

"An Early M. P. S." wishes for a formula for plate powder without mercury.—We believe rouge or calcined oxide of iron is the best plate powder for general purposes. For plated articles, chalk, wetted with a solution of cyanide of silver, and afterwards dried, answers very well.

"An Associate" (Dalston).—Succini Nitras, or resin of amber, as it is sometimes termed, is made by adding ʒiijss. of nitric acid to ʒj. of rectified oil of amber, allowing the mixture to stand for twenty-four hours and washing with cold water. The tincture is made by dissolving ʒj. of this resin in ℥iv. of rectified spirit. This is usually called tincture of artificial musk.

"Socius."—(1.) We are obliged to defer the article, which is in type, on Veterinary Medicines until next month.—(2.) Mr. Mart, of Oxford Street, is a maker of British wines.

C.—An imitation of lemon-juice is made by dissolving ℈ij. of citric acid in ℥j. of water, with a drop of oil of lemon. This cannot correctly be called fresh lemon juice.

S. S. P.—The question arrived after our last number was in the press. We cannot pretend to recommend any work on the subject.

"Explorator."—Practical Facts in Chemistry.—See our last, page 575.

Mr. Cayme.—The detection of adulterations in tobacco is one of the most intricate chemical operations, and in the present state of knowledge on the subject, no precise instructions can be given.

A. P. S. (Sleaford) ought to study some elementary work on Chemistry. When liquor potassæ is added to a solution of nitrate of silver, oxide of silver is thrown down.

M. S. H.—(1.) Acidulated kali, see vol. iii., p. 116 of this volume.—(2.) *Phillips's Translation of the Pharmacopœia*, is published by Highley, Fleet Street, price 10*s.* 6*d.*—(3.) *Lindley's Flora Medica.*—(4.) Candidates for Membership are not examined in Greek and Algebra.

"Alpha."—(1.) See the above, No. 2.—(2.) Aq. lavand., see vol. iv., pp. 99, and 243.—(3.) *Blaine's Veterinary Art.*

"An Apprentice."—We have answered all the six questions so often, that we think it needless to repeat the answers.

A. P. S.—(1.) See vol. ii., No. 8.—(2.) There is no specific rule applying to the case mentioned.—(3.) *Lindley's School Botany.*

G. S. B. H. R. (1.) wishes to know what composition will turn steel a beautiful blue.—(2.) To detect the presence of gamboge in powdered rhubarb:—Digest a portion of the powder in ether: drop this on water, when, if gamboge be present, an opaque yellow film will remain on the surface of the water, which will be soluble in liquor potassæ. For other tests, see *Pereira's Materia Medica*, p. 1676.—(3.) For a formula for Eau de Cologne, see vol. iv., p. 243.—(4.) Aquafortis is used for etching on steel.—(5.) Gold may be gilded by an amalgam of gold, the mercury being driven off by heat.—(6.) Volatile essence, for smelling bottles, is made by adding volatile oils and essences to a strong solution of ammonia.

C. A. D.—Animi resin is soluble in rectified spirit. Amber is soluble in oil of turpentine.

A. For an account of the Indian herb, Patchouli, see vol. iv., p. 60.

ʒj.—Black-lead, or plumbago, is an impure form of carbon, not always containing the same ingredients, but generally consisting of carbon, with a little silica, alumina, and oxides of iron, manganese, or copper.

Advertisements to Mr. Churchill, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. Smith, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to The Editor, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. II.—AUGUST 1st, 1845

THE NEW MEDICAL BILL.

Sir Robert Peel stated in the House of Commons, early in July, that Sir James Graham was desirous of reprinting the Medical Bill with certain modifications which appeared likely to be advantageous; and that if in its new form it should meet with the approval of the profession, it would probably be passed this session; otherwise Sir James Graham would not occupy the time of the house with unprofitable discussion, but would withdraw the Bill until next session.

Various rumours have been circulated as to the nature of the proposed alterations, and we were told in the *Lancet* of July 12th, that "the amended Medical Bill is dead," that the forthcoming Bill would be a new measure altogether. It had been proposed to change the name of the "College of General Practitioners," the words Medicine, Surgery, and Midwifery being struck out. This was not satisfactory to the parties concerned, and the Bill in that state seemed likely to be violently opposed. In fact, the New College would be reduced to an Apothecaries' Hall, with less power and independence than are enjoyed by that which now exists.

It has been subsequently stated, we believe on good authority that certain concessions are likely to be made by the College of Surgeons, which will supersede the necessity of establishing a new College of General Practitioners. This arrangement is particularly desirable, and we are convinced that no other plan is calculated so effectually to raise the professional character of Medical Practitioners, and promote harmony among all parties, as the identification of all Surgeons with their own College. Our chief objection to the New College of General Practitioners, and in fact our reason for discussing the subject at all is, that it would, according to the proposed arrangement, interfere with the province of the Chemists by perpetuating the union of Medical and Surgical practice with Pharmacy. The separation of these departments, as far as may be found practicable, is very much to be desired; and we hope shortly to be able to prove, by evidence which we are collecting on the subject, that in those places where the separation has been voluntarily effected, the interests of both parties have been promoted by the change, the jealously previously existing has subsided, and the public has been benefitted as well as the profession.

It is very difficult to divest the mind of prejudices which have existed for a series of years, and we are frequently told that an arrangement is impracticable, because it differs from that which has hitherto prevailed. If the plan at present in force worked well, it would be needless to propose any alteration; but as it is generally admitted that abuses and confusion, jealousies and encroachments, are inseparable from the present system, the most prudent course is to consider the subject *de novo*, and if possible to contrive some plan which shall be more conducive to the general welfare.

We anticipate much advantage to all parties from the establishment of Pharmacy as a distinct branch of the profession, and the advancement of education in this particular department. The cultivation of Pharmacy as a primary pursuit, and the institution, by Act of Parliament, of a qualification in this branch, with proper regulations for protecting the public against the imposition of ignorant persons, would remove one of the most glaring imperfections in the Medical legislation of this country. In our opinion this should have been the first step in the work of Medical reform; and it is to be regretted that its accomplishment has been made contingent upon the passing of the Medical Bill, an event which, up to the present time, appears rather hypothetical.

Unless the Members of our body unite systematically and energetically in the determination to secure themselves in their proper position, it is impossible to foresee how long the present state of suspense may be protracted, as it is not likely that the subject will be taken up with proper spirit by other parties, if those who are most intimately concerned in it show any symptoms of indifference. We trust our brethren are by this time convinced of the necessity of perseverance in the undertaking which is in progress, and that during the ensuing session of parliament these exertions will be crowned with success.

THE SCIENTIFIC COMMITTEE OF THE PHARMACEUTICAL SOCIETY.

In another part of this number, our readers will find four papers* which emanated from this Committee, and we are happy to state, that there is a prospect of much useful information being obtained from the same source during the ensuing year. Correspondents are appointed in several places in Europe and America, as well as in this country. It is the object of the Committee to establish a communication with all parts of the world, from which any products used in medicine or the arts are derived; and to obtain in this undertaking the assistance of any scientific men, merchants, and others, who may have the opportunity of extending the knowledge already possessed on these subjects. The encouragement already received affords every reason to anticipate a successful result, and we have no doubt that, as the objects of the Committee become generally known, the number of volunteers will increase in proportion.

In addition to the papers above alluded to, and others not yet published, numerous specimens have been received and contributions have been promised, which will be a valuable addition to the Museum. While these proceedings are promoting the success of the Committee, there is reason to believe that the advantage will in many cases be mutual, as by this means articles of commerce may be introduced into notice in this country, and thus become a source of revenue to the parties who enrich our list of Materia Medica, by bringing them before our notice.

Among the subjects which have engaged the attention of the Committee, we may mention kino, several rare varieties of rhubarb, the cultivation of rhubarb, the greenheart tree, Indian barilla from Calcutta, rose-coloured Dammar from Singapore, isinglass, the optical properties of some of the turpentines, a variety of substances from New Zealand, palm sugar, several rare varieties of cinchona bark; some of which form the subjects of the papers in this number.

The proceedings of the Committee for the present season are closed, and will be resumed in October. In the mean time we make this allusion to what has been done, in order to induce any of our members who may happen to have correspondents abroad, to place themselves in communication with the Committee, and thus to extend the sphere of its operations.

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* Page 64 *et seq.*

THE DUTIES OF CUSTOMS.

The New Act (which is printed entire, pages 87—94), contains a provision, in the fourth clause, for obtaining a statistical return of the amount and value of goods imported. On a former occasion we alluded to the official entries in the books at the Custom-house, as furnishing this information, which we considered to be one of the few advantages of the system; but we are glad to find that this return will be continued, although many of the duties are abolished. The machinery employed in keeping these accounts might beneficially be made available for another purpose; namely, that of exercising some control over the quality of articles imported for medicinal use. If a parcel of damaged meat, or other article of food unfit for use, were to find its way into the market, it would be condemned; and we think a similar check should exist in the case of drugs. While the duties were in force, they acted, to a certain extent, as a protection to the public, since any drug which was so much damaged or adulterated as to be worth less than the duty, was not likely to be cleared. But in the absence of this check, some other supervision ought to be enforced, and this would very properly come under the jurisdiction of a Council of Health, as proposed to be established in the Medical Bill.

We are informed that some manufacturing Chemists have remonstrated against the repeal of the duty on morphia, while that on opium is retained. This regulation would give an advantage to foreign makers over those in this country, and, we understand that the case having been fairly represented to the Treasury, the duty on morphia and its salts will be reimposed.—(*See Appendix.*)

Our readers must not suppose that the market price of the several articles in the list has varied in all cases in proportion to the changes in the duty, this being affected by a variety of other circumstances.

The repeal of the auction duty is an important benefit to wholesale Druggists. Formerly, the importers of goods might sell them, in the first instance, free of auction duty; but those who purchased them at such sales, could not afterwards sell them by auction without being liable to the tax of five per cent. on the amount realized. Consequently, the importer enjoyed an advantage of five per cent. over the merchant or druggist. By the repeal of the auction duty all parties are now placed on an equality in this respect.

EXCISE TRICKERY.

A short time ago, two persons, disguised in the garb of gentlemen, entered the shop of Mr. Bullen, surgeon, and one of them, showing the sleeve of his coat, which had been extensively greased, asked for a shillingsworth of spirit to remove the same. The young man recommended spirit of turpentine, but the gentleman had a particular objection to the smell of turpentine; æther was suggested, but in vain, he would have nothing but spirit of wine, and of that he must have one shillingsworth. While he was being informed of the fact, that it was illegal to sell spirit of wine without a licence for such a purpose, a young man from Mr. Hutchinson, of Farringdon Street, entered the shop, and recognised the two gentlemen as being excise-officers who had on the same morning endeavoured to entrap him by an artifice of a similar description. As soon as they discovered that they were detected, they fled.

We feel persuaded that the Board of Excise would not countenance trickery of this kind, and that the two excise-officers would have been reprimanded by the Board, if the charge could have been proved against them. Unfortunately, they escaped without leaving any clue by which they could be identified. If the young man had administered to the greasy coat the shillingsworth of spirit of wine in the form of tincture of asafœtida, this would have furnished a means of identifying the individual without any infraction of the excise laws.

ENGLISH PRESCRIPTIONS.

(MR. MUNTZ'S ACT OF PARLIAMENT.)

Mr. Muntz, a short time ago, gave notice of motion in the House of Commons respecting a Bill to compel Medical Men to write prescriptions in English, and to oblige Chemists to affix English labels on all their shop-bottles and pots. Mr. Muntz appears to think that too much mystery prevails in Medical matters, and that the public ought to be in possession of full information as to the nature of all substances used in Medicine. In order to make this information available, the public should receive a medical education; and extending the same principle to Surgery, the Bill should enact that every Surgeon, before performing an operation, should write *in English*, for the information of his patient, the name of every muscle, vein, or tendon which he proposes to divide, so as to remove all mystery on the subject. Every Act of Parliament has exceptive clauses, and in the above act there ought to be an exception in favour of patients who travel on the Continent, where the English language is not generally understood, and who ought to be allowed to have their prescriptions translated into Latin, which language is universally intelligible among persons connected with the Medical profession. Foreigners, also, when resident or travelling in this country, should be allowed to enjoy a similar privilege. When the Bill is discussed in the House of Commons, the reporters should have orders to take down the speech of Mr. Muntz on the occasion in roman capitals, instead of short-hand.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

ABSTRACT OF A LECTURE ON THE NATURE AND PHYSICAL HISTORY OF GLASS,

And on its Applications in Pharmacy and Practical Chemistry.

BY E. W. BRAYLEY, JUN., F.G.S.,
Member of the Chemical Society of London; Corresponding Member of the Philosophical Society of Basle, &c.;
Lecturer on Mineralogy applied to the Arts, &c.

[*Delivered June* 25, 1845.]

In the commencement of this lecture it was proposed, agreeably to a method which the lecturer had pursued for some years past, to consider Glass as an artificial *mineral substance*, and to illustrate its composition and properties in the same manner as that which would be adopted with respect to those of any natural mineral, with reference especially to its applications to practical purposes in Chemistry and Pharmacy, and in certain branches of the arts and manufactures. The propriety of this method of treating the various combinations of inorganic substances and mineral elements which are employed in the arts of life in the place of natural minerals, as forming, in fact, departments in the science of Mineralogy applied to the Arts, had been confirmed, it was remarked, by its having also been followed by Sir Henry T. De la Beche, in the Museum of Economic Geology, in which specimens of enamel, porcelain, earthenware, bricks, and tiles, &c. were exhibited under the same classification.

It was then noticed, that many compound bodies (and possibly some elementary substances also) exist under two general forms or conditions—the vitreous or glassy, and the crystalline or stony. This was illustrated, in the first instance, from the history of *natural glass*, as a frequent product of volcanic action. Specimens were exhibited of the various forms of volcanic glass, or glassy lava, which have received the names of obsidian, pitchstone, pearlstone, pumice, &c. Their properties and chemical composition were briefly explained, and it was shown that they were merely the glassy form of ordinary lavas, basaltic, as well as trachytic. Like natural glass, it was observed, the artificial glass of the arts (using that term in its widest acceptation), includes a variety of chemical combinations of silica with bases, whether alkalies, alkaline earths, or the oxides of the common metals, in the vitreous or glassy condition; their utility and applicability being uniformly impaired or destroyed by their passage into the crystalline state. A series of specimens exhibiting the transition of several kinds of ordinary glass from the vitreous to the perfectly stony or crystalline state was explained, including a common green wine-bottle, which had been completely *devitrified*, and converted into what has been termed *Reaumur's porcelain*, by continued exposure to a softening but not a fusing heat in the great fire at Hamburgh.

The history of the progress of science, with respect to the theory of this devitrification of glass was next adverted to, as exemplifying, in a remarkable manner, the reciprocal illustration of distinct and widely different subjects of philosophical investigation by each other; in the present instance, the theory of the crystalline rocks in chemical geology, and the history of vegetable juices in organic chemistry. Mr. Gregory Watt, in 1804, suggested the emission of heat previously in the latent state, as the intimate cause of the passage of the glass resulting from the artificial fusion of basaltic rock into a stony substance by slow cooling, and its final return to its original crystalline texture; and he appears to have extended this theory, by implication, to the conversion of common glass into Reaumur's porcelain. But the theory of devitrification seems afterwards to have been neglected, until Professor Graham, nearly forty years afterwards, first discussed the subject in a comprehensive manner, in his *Elements of Chemistry*. He showed, experimentally, that the passage of sugar and certain saline bodies from the vitreous to the granular-crystalline state is attended by a remarkable evolution of heat; producing in the case of sugar an elevation of temperature of 70° Fahr. Professor Graham infers "that glass itself, like transparent barley-sugar, owes its constitution and properties to the permanent retention of a certain quantity of latent heat;" and generally, "that all bodies differ when in the vitreous and in the crystalline forms, in the proportion of combined heat which they possess."

Mr. Brayley, however, while adopting these views, differed from Professor Graham, in ascribing the devitrification of glass, not to the separate crystallization of the simple silicates, or combinations of silica with alkalies or metallic oxides (of which glass, in its ordinary state, may be conceived to be a mixture), but to the crystallization of the entire mass of the glass, as one compound silicate, analogous to the compound silicates constituting many siliceous minerals in nature. The further prosecution of this part of the Chemistry of glass was reserved for a second lecture.

What may be termed the philosophy of the subject having been thus considered, the nature and physical history of the different kinds of glass employed in the arts was entered upon, with which a succinct view of the processes of manufacture was combined.

Crown-glass, or common window-glass (and of which a finer kind is also employed in the construction of compound achromatic lenses for telescopes), composed of silica, soda, and lime; and *plate-glass*, of similar composition, but containing a larger proportion of alkali, having been summarily described, *flint-glass* and *green bottle-glass*, the two kinds most important to the Chemist and the Pharmaceutist, were treated of at greater length.

Mr. Christy, of the Stangate glass-works, having kindly contributed a series of specimens of the actual materials employed in the manufacture of flint-glass, as used for phials, chemical vessels, barometer and thermometer tubes, &c., as well as of the glass itself in the successive stages of the process, that process was detailed. The materials, essentially, are silica, in the form of fine sand, from Lynn, in Norfolk, or from the tertiary strata of Alum Bay, in the Isle of Wight; potash, in the form of pearl-ash; or soda, in that of purified soda-ash; and protoxide of lead, in the form of litharge; red-lead being sometimes employed, in which case a portion of oxygen gas is liberated during the process.

The result of the intimate mixture and complete fusion of these materials, together with a portion of broken glass of the same description, for about forty-eight hours, is *flint-glass*. Tables were exhibited of the chemical composition of different specimens of this glass, as found by analysis. Ordinary English flint-glass, analysed by Mr. Faraday, gave silica 51 93, protoxide of lead 33.28, potash 13.77. Another specimen, analysed by Berthier, contained silica 59.2, protoxide of lead 28.2, potash 9, with minute proportions of the oxides of iron and manganese. This was London glass used for chemical purposes.

The chemical history of *green bottle-glass*, consisting, essentially, of silica, alkali, and a larger proportion of lime than that contained in crown-glass, was illustrated by a specimen of the spurious kind, recently examined by Mr. Warington, which, in consequence of its containing an excess of lime, is readily acted upon by dilute sulphuric or muriatic acid, and even by a weak solution of tartaric acid, all which destroy the glass by producing salts of lime and separating the silica. A similar glass is manufactured at Paris, which is acted upon, according to Berthier, by vinegar.* The genuine green bottle-glass, whether French or

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* The following additional particulars on this subject are extracted from Mr. Warington's paper, as published in the *Memoirs of the Chemical Society*:

"Some green glass wine-bottles were put into my hands for examination, the inner surface of which was covered with a thin film, having a dull

English, contains about sixty per cent. of silica, not more than about twenty of lime; the proportion of alkali being about eleven per cent. in the English, but not more than three or four per cent. in the French, which usually contains a greater amount of alumina and oxide of iron. The spurious kind contains about twenty-five per cent. of lime.

The *pale green glass*, manufactured in France for phials and chemical apparatus, resembles the best specimens of English green bottle-glass, both in composition and properties.

The molecular condition and mechanical properties of glass in general were noticed, and its various relations to heat, including the theory of the process of annealing it, and of the section of glass by the diamond. It was shown, after Dr. Wollaston, that if the form of cutting edge possessed by the octahedral diamonds with curved surfaces employed by the glazier (and to which the line of the intended cut in the glass must form a tangent, in order that the superficial fissure may be produced, which is afterwards extended through the thickness of the glass), be given to other substances harder than glass, as the ruby, or rock-crystal, they also will have the power of *cutting* glass, but their hardness is insufficient for the retention of that power, owing, among other circumstances, to the film of silica or highly silicated matter which appears to form the surface of glass in its natural state, and which, by its own great hardness, abrades and gradually destroys the cutting edge.

The subject of the real chemical nature of perfect glass, as actually in use, and of its hygrometric properties and its relations to chemical agents, was entered upon; some early results obtained by Sir H. Davy, dependent upon the action of water even upon the best glass, being cited, and also the later experiments of other chemists. But the more particular illustration of these subjects was reserved for a second lecture.

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and slightly opake appearance, * * * the surface of the glass having been evidently affected by the action of some corroding agent. * * * On making additional inquiries concerning these bottles, I found that they were offered to the consumer, the wine-merchant, at a lower price than the ordinary wine-bottles, and that the vendors urged strongly the superiority of their goods, under the recommendation that they caused port wine to deposit its crust much sooner and firmer; that is, adhering more tightly to the bottle, than would be the case where the common glass was employed. One gentleman had been a loser to a considerable amount, from bottling a large quantity of white wine in these vessels, the bottles having become clouded, and the flavour of the wine, as a matter of consequence, being materially affected."

PHARMACEUTICAL MEETING,

JULY 9th, 1845.

MR. MORSON, VICE-PRESIDENT, IN THE CHAIR.

ON THE MORINGA PTERYGOSPERMA, OR OIL OF BEN TREE,

AND ITS USES ECONOMICAL AND OFFICINAL.

BY WILLIAM HAMILTON, M.B.

The moringa pterygosperma, or horseradish tree, although not a native of the West Indies, is now perfectly naturalized there, and merits attention both for its economical and pharmaceutical properties.

It is a small tree, of about twenty feet in height, but of most rapid growth, coming into flower within a few months after the seed has been sown, and continuing to produce seeds and blossoms afterwards throughout the year. Its roots have all the flavour and properties of the horseradish, for which it is often substituted at the tables of the planters. The timber is said to dye a fine blue; and the gum which exudes from wounds in the bark bears a strong resemblance to that obtained from the astragalus tragacantha, for which it might, no doubt, be substituted. The timber was formerly held in estimation for medicinal properties, which it was reputed to possess, and may be found spoken of in some of the older medical writers under the name of *Lignum nephriticum*, from its supposed efficacy in complaints of the kidneys and urinary organs. It gives out a blue colour to spirit or water, which by transmitted light appears of a golden yellow; the blue is destroyed by acids, which leave the tincture or decoction of a bright yellow, but is restored by the addition of an alkali.

The numerous racemes of white blossoms with which the moringa or horseradish tree is constantly loaded, are succeeded by long triangular pods, somewhat torulose at the seeds, and about two feet in length, when arrived at their full growth. These pods, while yet young and tender, are not unfrequently cooked and served up to the planters' tables like asparagus, for which they are no bad substitute. Each pod, when full grown, contains about fifteen seeds; each considerably larger than a pea, with a membranous covering expanding into three wings, whence the specific name of Pterygosperma: a kind of isthmus is interposed between each of these seeds, forming the pod into as many cells as it contains seeds.

On removing the winged envelope, the seeds appear somewhat like pith-balls; but, upon dividing them with the nail, they are found to abound in a clear, colourless, tasteless, scentless oil, of which the proportion is so large that it may be expressed from good fresh seeds by the simple pressure of the nail. Geoffry informs us, that he obtained 30½ ounces of oil from 8 pounds of the decorticated seeds, being at the rate of very nearly 24lbs. of oil from 100lbs. of seeds. The oil thus obtained is the celebrated oil of Ben or Behen, which, at one period, constituted a valuable branch of commerce with the east, until excessive imposts and extensive adulteration brought it into unmerited disrepute.

The moringa-tree, as we learn from Dr. Broughton's Catalogue of East's Garden, inserted in the third volume of *Edwards's History of the West Indies*, was introduced into Jamaica from the East Indies in the year 1784, and most probably found its way into the other islands about the same time. Yet though thus established for the best part of three-quarters of a century among our planters, notwithstanding the great value of its oil, and the facility with which it can be obtained, the moringa-tree has been hitherto valued merely as an ornamental shrub, and cultivated for the sake of its young pods, or the horseradish of its roots, as luxuries for the table.

The oil which is so profusely obtained from the seeds is peculiarly valuable for the formation of ointments, from its capability of being kept for almost any length of time without entering into combination with oxygen.

This property, together with the total absence of colour, smell, and taste, peculiarly adapts it to the purposes of the perfumer, who is able to make it the medium for arresting the flight of those highly volatile particles of essential oil, which constitute the aroma of many of the most odoriferous flowers, and cannot be obtained, by any other means, in a concentrated and permanent form. To effect this, the petals of the flowers, whose odour it is desired to obtain, are thinly spread over flakes of cotton wool saturated with this oil, and the whole inclosed in air-tight tin cases, where they are suffered to remain till they begin to wither, when they are replaced by fresh ones, and the process thus continued, till the oil has absorbed as much as was desired of the aroma; it is then separated from the wool by pressure, and preserved, under the name of *essence*, in well-stopped bottles. By digesting the oil thus impregnated in alcohol, which does not take up the fixed oil, a solution of the aroma is effected in the spirit, and many odoriferous tinctures or waters, as they are somewhat inaccurately termed, prepared which could not otherwise be obtained. By this process most delicious perfumes might be obtained from the flowers of the Acacia tortuosa, Pancratium carribeum, Plumeria alba, Plumeria rubra, and innumerable other flowers of the most exquisite fragrance, which abound within the tropics, blooming unregarded, and wasting their odours on the barren air.

14, *Octagon, Plymouth, June* 1, 1845.

ON THE GUM OF THE RHUS METOPIUM, AND ON THE ARISTOLOCHIA ODORATISSIMA, TRILOBATA, AND ANGUICIDA.

BY WILLIAM HAMILTON, M.B.

THE rhus metopium is a small tree of some twenty-five feet in height, not unfrequent in the West Indies, and especially in the forests of Jamaica, where the gum which exudes from its bark has been long known for its medicinal properties, although little employed by the regular practitioners. It is commonly known by the names of hog-gum and hog-doctor tree, from an opinion which is generally entertained, and rests no doubt on observation, that the wild hogs, which abound in many parts of the island, cure themselves of any wounds which they may chance to have received, by rubbing themselves against the trees from which this gum exudes,* and thus smearing the excoriated part over with a coating of it. This circumstance, first observed no doubt by the negroes, naturally directed attention to its vulnerary qualities, and led to its trial as a salve for healing sores. For this purpose it is boiled with the oil of the Ricinus communis, to which is occasionally added the expressed juice of some of the species of dolichos, known by the name of cat's claws (as the Dolichos filiformis), when the object is to check the discharge from a running ulcer.

The hog-gum first exudes from the wounded bark in the form of a pellucid juice of a yellowish-white colour, which becomes darker by exposure to the air, and gradually acquires a black colour, and a hard brittle resinous consistence.

In its recent state, this juice, taken to the extent of one or two table-spoonfuls diluted with an equal quantity of water, and sweetened with a sufficiency of sugar, is said by Dr. Barham to afford relief in cases of colic, and to act at the end of four or five hours as a mild aperient. It is also employed for the same purpose in the shape of an enema.

By age it acquires a harder consistence, and becomes astringent in its properties. In this state it is reputed to act as a diuretic upon the urinary organs, and is given in pills for the cure of gonorrhœa, resembling in its effects the more costly balsam of copaiva, for which it might not improbably be substituted with advantage in our shops.

Applied in the form of a plaster to the inflamed part, this gum is said to afford relief in gout and rheumatic affections; acting in these cases not improbably as a substimulant, and exciting the action of the absorbents.

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* For this purpose, taught by what in our ignorance we designate by the unmeaning appellation of instinct, the boars when they do not chance to meet with a tree already wounded and pouring forth its balsamic juice, rip up the bark with their tusks to obtain it. Is not this something closely bordering on reason?

As a topical application to recent wounds and excoriations, both Barham and Browne speak in the highest terms of its vulnerary effects; and the former recommends a cerate, prepared according to the following form, as an excellent remedy for recent wounds :—

℞ Gummi rhus metopii,
Adipis præparati, āā ℥iv.
Ceræ albæ,
Pulveris aristolochiæ odoratissimæ, āā ℥ij.
Resinæ flavæ, ℥j.
M. s. a. ut fiat ceratum.

The aristolochia, which enters into the composition of the above preparation, is a climbing plant frequent in the woods of Jamaica, where it is in considerable estimation among the local practitioners under the names of *birthwort* and *contrayerva*. Its roots and seeds are bitter and aromatic, and are reputed to be powerful antidotes to the poison of serpents and other venomous reptiles. The roots in decoction are an excellent tonic and stomachic, but as their active principle is more completely soluble in spirit than in water, the tincture is a still better preparation, and combined with iron very effectual in restoring the menstrual discharge when it has been suppressed or interrupted.

This plant is so abundant in Jamaica, that, were a market found for it in England, a supply to almost an unlimited extent might be obtained; entitling it to the attention of the medical practitioners as a cheap and valuable substitute for some of the more costly articles of the Materia Medica of our shops.

There are many other species of aristolochia common within the tropics, and equally entitled to attention for their medicinal properties: of which the Aristolochia trilobata is to be met with on the south side of Jamaica as abundantly as the A. odoratissima is on the north, and the infusion of its roots is a favourite stomachic with the negroes, who are in the constant habit of employing it, under the name of bastard contrayerva.

In the woods which clothe the hills adjoining the town of Carthagena, the capital of the province of that name in South America, is found another species, the Aristolochia anguicida, known to the inhabitants by the name of snake poison, or contra capitan, the external and internal use of which, if employed in sufficient time, is said to counteract the bite of the most deadly serpents. The Indian jugglers mix the juice of its roots by mastication with the saliva, of which they introduce a few drops into the mouths of the snakes which they exhibit, in order to stupify and enable them to handle them with impunity.

Facts such as these are well worth medical investigation.

14, *Octagon*, *Plymouth*, *June* 15*th*, 1845.

THE COMPOUND INFUSION OF HORSERADISH.

BY MR. THOMAS GREENISH.

In making the above preparation, I have on several occasions observed a remarkable difference in the product, but was for some time at a loss to know to what I could properly attribute it. The formula is,

Horseradish root sliced	one ounce,
Mustard-seed bruised	one ounce,
Boiling distilled water	one pint,
Compound spirit of horseradish	one ounce.

Macerate the horseradish root and mustard-seed in the water two hours, then strain, and add the compound spirit of horseradish.

Having recently made a few experiments, with the view of ascertaining under what conditions the change which I had observed took place, I am induced to bring the subject before the notice of this Society, in the hope that it will not be altogether uninteresting, and may likewise tend to produce greater uniformity of result. I procured sufficient horseradish root and black mustard-seed to make several infusions, and after slicing the root and bruising the seed, I took the requisite quantity for half a pint of water. In the first infusion, I took care to scald out the infusion jug, to avoid loss of heat, so that the ingredients may be put together at a temperature of 212°. No perceptible change took place during the period of maceration, and in two hours it was strained off and the compound spirit of horseradish added; the product has not the acridity we should be led to expect in it, the predominant taste being horseradish, and that by no means strong. A sample is on the table, No. 1.

In the second infusion, I took the same quantity of ingredients and boiling water as before, but omitted to scald out the jug, thereby losing sufficient heat to lower the temperature considerably. In about half an hour I took off the cover to examine it, when a highly penetrating acrid vapour very irritating to the eyes was evolved, and after being strained off at the expiration of two hours, and the compound spirit of horseradish added, its smell and hot pungent taste rendered it evident to the senses that the infusion was not weaker, as may have been expected from the lower temperature, but that the product was in fact totally different to that of the former experiment. A sample is on the table, No. 2.

I am afraid that sufficient attention has not been paid to the fact, that the *Sinapis nigra* is the officinal mustard of the London Pharmacopœia. Feeling, however, interested in the subject, I made the same experiments with the white seed, and find that under the same circumstances the results are similar, excepting that instead of a *volatile* oil being generated, as with the black mustard-seed, a *non-volatile* acrid substance is produced, which materially alters the product, although not so sensibly as in the former case. The two infusions, No. 1 and No. 2, are on the table, corresponding with the same numbers of the former experiments, made with the black mustard-seed.

Although the volatile oils of the natural order Cruciferæ, to which mustard belongs, have been as yet but little studied, several continental Chemists have directed their attention to them, and more particularly to that of mustard; and it is to their researches that we are indebted for our present knowledge of the subject. It appears that two of the proximate principles of black mustard-seed are myronic acid and myrosyne, or emulsin of black mustard, and that, with the aid of water, by their mutual action the volatile oil of mustard is generated; I suppose by contact, as in the emulsin and amygdalin of the almond, when the hydrocyanic acid and oil of bitter almonds are generated. I find, likewise, that acids, alcohol, and heat prevent the formation of the volatile oil; not having used either of the two former, I could only attribute the result to the different temperatures of the water employed in the two infusions, and on further reference to the analogous principle, emulsin, in bitter almonds, I find that it is coagulated at 212°, and rendered thereby incapable of acting on the amygdalin for the production of the volatile oil, which I presume to be the case in the present instance; and that its development in the infusion No. 2 is due to the lower temperature, occasioned by the loss of heat, consequent on the omission of scalding out the infusion jug, the temperature being under that which is required to coagulate the emulsin. I observed, however, that if the infusion No. 1, in which the emulsin has been coagulated, be allowed to stand for about twelve hours, the volatile oil becomes developed to a considerable extent.

The proximate principles of white mustard differ from those of the black; the product of the latter being a *volatile* acrid oil, and that of the former a *non-volatile* acrid substance, but the production of both is influenced by heat in a similar manner.

Although the horseradish does not, I believe, to any extent influence the above results, it demands at least a few observations from the supposed identity of its volatile oil with that of the black mustard. From the researches of MM. Boutron, Frémy, and other continental Chemists, it would appear that the horseradish root contains similar principles to the black mustard-seed; the odour, specific gravity, and reactions of the volatile oils produced seem to establish their identity, but the manner in which it is formed differs. The root in its natural state is quite inodorous, but contains sufficient water, so that when cut or bruised, the proximate principles are brought into contact, and the same action takes place in the root as in the jug, when water is added to the mustard-seed, followed by the development of the volatile oil.

In reference to its therapeutic employment, it is of the utmost importance that the laws which regulate the production of this oil should be well understood, in order to fulfil the intentions of the prescriber; and the dispenser would find himself in an unenviable position if, after having supplied draughts made with the infusion where the emulsin is coagulated, he were to furnish a fresh supply in which the volatile oil had been generated. The scientific Pharmaceutist would readily perceive in the lower temperature the real cause of the mischief; but the confidence of the patient, whose knowledge of proximate vegetable principles must necessarily be limited, would be materially shaken, and the unfavourable impression then formed would be with difficulty removed, even with the advantage of an opportunity to offer a full explanation of the cause, which very frequently is not afforded him.

30, *Conduit Street.*

The following papers from the *Scientific Committee* were read :

ON PALM SUGAR.

Dr. Pereira laid before the meeting two specimens of palm sugar, one from Cuddalore in the East Indies, the other from Mogadore.

The specimen of *Cuddalore palm sugar* was furnished to him by a former pupil, Mr. James Stevens, who had recently arrived from Cuddalore as surgeon to a vessel, which brought to this country a large quantity of palm sugar. This sugar belonged to the class of white or refined sugars. It is yellowish white, and has the texture and flavour of refined cane sugar. Subjoined is a notice of this sugar furnished to Dr. Pereira by Mr. Stevens.

The other sample of *palm sugar* came from Mogadore. Dr. Pereira obtained it from a broker, under the name of "*Date Sugar from Mogadore.*" It is a brown or unrefined sugar, but wants the sparkling crystalline texture of brown cane sugar.

A broker informed Dr. Pereira that the *palm sugars* (known in trade as *date sugars*) brought from Cuddalore, Mogadore, and other places, are deficient in what is technically called *strength :* that is, when refined, they form a sugar which crumbles in drying. Hence these sugars are sold, as imported, to the grocers for mixing : they do not pay for refining.

ON PALM SUGAR FROM INDIA.

BY MR. JAMES STEVENS.

Palm sugar is manufactured principally at Cuddalore on the Coromandel coast, by some French merchants of Pondicherry, by which means it comes into the English market as colonial sugar, whereas, if made at Pondicherry, it would bear the heavy duty of foreign produce.

It is mostly got by refining the *jaggary* or crude sugar used by the poorer classes in India. *Jaggary* is darker coloured than the coarsest Muscovado sugar. It is granular or moist; comes in a mat or bag made of palm leaves; is chiefly brought from the island of Ceylon by native vessels (donies) and is made by inspissating the juice of various kinds of palm, principally the *Palmyra* or brah palm, also the cocoa palm, and the *lesser fan palm*, and to the northward, the wild date palm. The juice is collected during the night, by making incisions in the upper part of the stems of the trees, and afterwards boiling it down before fermentation takes place; chunam (lime from sea shells) being added to retard the same. The thick syrup thus obtained is mixed with sand and stones to the amount of ten or fifteen per cent. to make it more solid, portable, and heavier (of course this is done by the natives, the most abominable set of rascals under the sun). The same juices, before they ferment, form a cool and pleasant drink, toddy; but if allowed to go on to vinous fermentation, become arrack, which is distilled. In India, all the palm plantations (toddy topes) used for the last two purposes, pay a duty to the Company of one rupee (1*s.* 10*d.*) each tree per year.

At Cuddalore there are five sugar-houses, the principal of which belongs to Viney and Cardoza of Pondicherry. Their plan is to dissolve the jaggary in water over a fire, at the same time mixing chunam, to check fermentation, with it; after this it is strained through a filter of animal charcoal, again boiled, and strained through cotton bags. For the purposes of clarifying, they use eggs and chunam. When the syrup is of a proper consistence, it is put into wooden or earthen coolers, and the molasses allowed to drain off. To whiten it as much as possible, rum, or sometimes a fine syrup, is poured over the sugar whilst in the coolers; it is then exposed to the sun to dry, and lastly packed in gunny bags for exportation. It is never mixed with cane sugar. The sugar thus produced, I have no doubt, will eventually supersede the cane sugar. It can be manufactured at a less cost, and the palms affording it grow in abundance in all parts of the tropics, in a dry sandy soil, which would produce nothing else of value. They require very little cultivation—merely enough to keep the luxuriant vegetation from springing up into a jungle around them, and to remove the numerous parasitical plants from their stems. Of course the sugar will improve in quality when more experience has been gained in the way of making it—the oldest factory having been established only five years. The quantity produced I should think was above six thousand tons last year. The molasses are at present of little or no value in the English market, but two of the houses at Cuddalore, are making rum of it, a sample of which came to England this winter.

The Palmyra and cocoa palms grow to the height of 100 feet or more, in eight or nine years, and the latter variety will for many years yield 500 nuts per annum, a succession of fruit being produced on the same tree throughout the year; the Palmyra palm leaves are used for writing purposes by the natives, they scratch the letters on the leaf with a style.

Were the French colonists at Pondicherry to manufacture sugar in their own territory, they would not be allowed to import it into France. By a treaty between them and the East India Company, they abstain from manufacturing opium and salt, in consideration of which they are paid by the Company a sum of money, sufficient to defray the expenses of government both at Pondicherry and Bourbon. However, the settlers would prefer being under the rule of the British, as they consider their commerce would be benefited by it.

ON THE ORIGIN OF SAMOVY ISINGLASS.

BY DR. PEREIRA, F.R.S.

Among the numerous kinds of isinglass known in English commerce, there is one which is well known by the name of *samovy isinglass.* It is imported from Russia in three forms, viz., as *leaf*, *book*, and *short staple*, and is in considerable demand among brewers for making finings.

Some doubt has hitherto existed as to its origin. In the last edition of the *Elements of Materia Medica*, I stated two reasons for believing that it was the produce of the fish called by naturalists the *Silurus glanis*, these were, first, that the Russian name of this fish was *som*, a term from which the word *samovy* or *somovy* might possibly be derived. Secondly, that according to Martius, from this fish are obtained, leaf, book, and staple isinglass, the three forms in which samovy isinglass occurs in English commerce.

Mr. Faber was kind enough to enquire, at my suggestion, of his Russian correspondents whether this opinion was well founded or otherwise, and I have recently received the following communication from him on the subject: "I have ascertained," he says, "from some of my Russian friends, that what you supposed, is quite correct, viz., that the samovy isinglass comes from the Russian fish *som*. The Russians, having no article, make an adjective of *som* by adding *ovy*, and then pronounce it *samovy*, although *they* spell it *somovy*."

ON THE CIRCULAR POLARIZATION OF SEVERAL TEREBINTHINATE SUBSTANCES.

BY DR. PEREIRA, F.R.S.

In 1818 Biot announced the existence of the property of circular polarization in several liquids. The statement was made on the 22d of September, 1818, in a paper read at the Academy of Sciences, and published in its *Mémoires* for the year 1817. In this memoir Biot states that he had accidentally discovered the rotation of oil of turpentine, while engaged in the examination of crystallized laminæ placed in very refractive media, such as this oil. He perceived that the oil modified the condition of the polarized rays which traversed it; and on examination found that this liquid possessed that remarkable property of rotating the planes of polarization of luminous rays, which is commonly denominated circular polarization.

Biot observes, that while in quartz or rock crystal, there exist two opposite directions of rotation, in oil of turpentine the rotation is constantly in one direction, namely, from the right towards the left of the observer. He made a number of experiments to determine the extent or degree of rotation, and concluded, that in *commercial oil of turpentine*, at the temperature of 68° Fahr., the mean rotation of the rays transmitted by red glass is, for every centimètre [= 0.39371 of an English inch], 2°7057: but that in *oil of turpentine, purified by several distillations*, and at the temperature of 37°4 Fahr., the mean rotation of the same rays is, for every centimètre, 2°8628.

Biot examined other liquids, and found several which also evinced rotatory phenomena; and in some the rotation was in an opposite direction to that of oil of turpentine. Thus, he found that the *essence of lemons* had a *right*-handed, while *oil of turpentine* had a *left*-handed rotation. Moreover, the energy or degree of rotation was found to be very unequal; for while a column of 151½ millimètres [= 5.96 English inches] of essence of lemons rotated the red rays 66° to the right, a column of oil of turpentine of the same length rotated the red rays only 38° to the left: so that the rotatory force of the essence of lemons was to that of the oil of turpentine as 66 to 38. Consequently, by mixing 66 parts of oil of turpentine with 38 parts of essence of lemon, a mixture was obtained, which did not evince rotatory phenomena; since the rotatory power of the one liquid was compensated by that of the other.

In the 13th volume of the *Mémoires de l'Academie des Sciences*, 1835, appeared another paper by Biot, entitled *Mémoire sur la Polarisation circulaire et sur ses applications à la Chimie Organique.* This memoir was read at the Academy on the 5th of

November, 1832. In it Biot states that a column of 152 millimètres [=5.98 English inches] of oil of turpentine caused the rotation of the red rays to the left, through an arc of 45°; or, by calculation, through an arc of 59°.21 for a column of 200 millimètres [=7.87 English inches]. The oil had been rectified with great care by M. Dumas, and was the same as that of which he published an analysis in the *Annales de Chimie et de Physique*, for July, 1832. Biot does not, however, state the temperature of the oil at the time at which he determined its rotating power; but it is obvious that this highly rectified oil possessed a higher rotating power than those oils, the polarization of which he had noticed in his first memoir, and which I have just referred to.

On the 4th of December, 1843, my friend, Dr. Leeson, Assistant Physician to St. Thomas's Hospital, read a paper before the Chemical Society of London, and which has been published in the second volume of the Society's Memoirs entitled "*Observations on the Circular Polarization of Light, by transmission through Fluids.*" In this paper Dr. Leeson states, that every sample of oil of turpentine which he had examined, possessed a *right*-handed rotation, and that he had been unable to find any oil of turpentine with a left-handed rotation, as described by Biot. In fact, he had observed that the rotations of oil of turpentine and essence of lemon, instead of being opposite, as stated by Biot, were identical; that is, they coincided in direction, being in both cases right-handed, though they differed in degree. Thus a column of ten inches of essence of lemon, effected a rotation to the right of 150°; while the same length of column of rectified oil of turpentine, effected a rotation also to the right of 50°, and that of common oil of turpentine of 40° only.

As soon as Dr. Leeson's paper appeared, I submitted several samples of English oil of turpentine to careful examination, and satisfied myself of the accuracy of Dr. Leeson's observation, that the rotation was right-handed. But entertaining a full confidence in the accuracy of Biot's statements, I immediately suspected that the liquids examined by these two observers were dissimilar; and my knowledge of the natural history of the French and English oils of turpentine confirmed my suspicions. Indeed, I had long previously suspected that there were some remarkable differences between different kinds of oils of turpentine, from the fact of the unequal quantities of artificial camphor, which had been respectively obtained from them.

Oil of turpentine of French commerce is obtained from what is called *Bordeaux turpentine*, which is the produce of the *Pinus maritima* of De Candolle (the *Pinus pinaster* of Lambert) a coniferous tree, which grows abundantly in the southern maritime parts of Europe, especially in the neighbourhood of Bordeaux, and between that city and Bayonne.

Oil of turpentine of English commerce, on the contrary, is almost exclusively procured from *American turpentine*, the produce chiefly of *Pinus palustris* of Lambert, but partly also of *Pinus tæda* of Lambert. These two species grow in Virginia and Carolina, which States principally supply the American turpentine of commerce.

In order to ascertain the accuracy or inaccuracy of my suspicions, I wrote to my friend, M. Guibourt, Professor of Pharmaceutical Natural History in the School of Pharmacy at Paris, begging him to send me a sample of French oil of turpentine which possessed the left-handed rotation described by Biot. I at the same time explained to him Dr. Leeson's observations on the English oil, and my suspicions that the French and English oils possessed different optical properties, derived from their different origin.

In February last I received a reply to my application with two samples of French oil of turpentine. In his letter to me on the subject, M. Guibourt observes, that "M. Biot ascribes the result obtained by Dr. Leeson, of the right-handed polarization of the essence of turpentine to a difference in the mode of observation."

One of the samples of oil is marked "*Essence of Turpentine rectified with Water.*" Its density is 0.871. The other is marked "*Essence of Turpentine of Commerce.*" The density of this is 0.880. Both samples possess *left-handed* rotation; thus establishing the accuracy of my conclusion, that the French and English oils of turpentine have opposite rotations. I may further observe, that Dr. Leeson examined them at my house, and is quite satisfied that the direction of the rotation is that which Biot has described it, namely *left-handed.* I have also satisfied Professor Guibourt and M. Bourchardat, that English oil of turpentine possesses *right*-handed rotation; for in my recent visit to Paris, I took with me a sample of the English oil, which was carefully examined by M. Bourchardat, at the Hotel Dieu, with Biot's instrument, in the presence of Professor Guibourt and myself; and M. Bourchardat instantly acknowledged that it was *right*-handed.

I find also, as might be expected, that by mixing the two oils in proper proportions, their rotatory powers are mutually compensated; and a mixture is obtained which does not present rotatory phenomena. M. Guibourt was kind enough to send me the results of the examination, made by himself and M. Bourchardat, of several species of turpentine. These are included in the subjoined list.

During my examination of these substances, I observed a curious and important phenomenon, namely a remarkable molecular change, attended with an alteration in the direction of rotation produced on some of these bodies by the action of heat. For I assume that the circular polarization of liquids, unlike that of quartz, is a molecular property, since it is independent of the position, mutual distance, and repose or motion of the molecules. The change referred to I first observed in the case of balsam of Canada, a substance usually regarded as a compound of volatile oil and resin. Now the rotation of the balsam is right-handed, but that of the volatile oil obtained from the balsam by distillation, without water, is left-handed. This fact, which I communicated some months since to Professor Guibourt, I at first supposed to be explicable by the existence in the balsam of two substances of different volatilities and opposite rotating powers: the more volatile one possessing left-handed, while the less volatile, but preponderating ingredient, was endowed with right-handed rotation. But to my surprise I found that the resinous residue in the retort, as well as the volatile oil which distilled over, possessed left-handed rotation. I am driven, therefore, to the conclusion, that both the oil and the resin were products, not educts: that is, they did not pre-exist in the balsam, but were formed under the influence of heat.

The turpentines (*oleoresins*) and the volatile oils obtained from them by distillation, may be conveniently, for my present purpose, arranged in two series, the one including those which rotate the polarized rays in a left-handed direction, and which I shall call *lævo-gyrate*; the other, embracing those which rotate the planes in a right-handed direction, and which I shall term *dextro-gyrate.*

1. LEFT-HANDED OR LÆVO-GYRATE TURPENTINES.

1. *Bordeaux turpentine,* the produce of *Pinus maritima,* very transparent, and of an honey-yellow colour, contained in a flask of seventy millimètres [= 2.75 English inches] in diameter. It was difficult to observe its polarizing property; for its deep colour obstructed the perception of the second image. M. Bourchardat, by examining it alone, found that for a thickness of seventy millimètres, it had a left-handed rotation of 8°; that is, it required the doubly-refracting analyser to be turned 8° to the left to obtain the second image of the blue colour of the flower of flax (*Linum usitatissimum*).

2. *Commercial and unrectified Oil of Bordeaux turpentine.* Density 0.880 at 48° Fahr.—Left-handed rotation 33°1, for a length of 100 millimètres [3.93 English inches] that is, it required the doubly-refracting analyser to be returned 33° to the left to obtain the second image of the colour of the flax-flower, or a violet pale blue.

3. *Oil of Bordeaux turpentine rectified without water.*—M. Guibourt took 2 kilogrammes 250 grammes [about 6lbs. troy] of good oil of Bordeaux turpentine, and put it into the cucurbit of an alembic, and distilled, without the addition of water, 500 grammes [about 1¼lb. troy] of oil. The oil had a density of 0.871 at 48° Fahr.; and with a column of 100 millimètres, it produced a left-handed deviation of 37° 8.

4. *Oil of Bordeaux turpentine, rectified with water. First product.*—After the preceding oil had distilled over, M. Guibourt put some water, and again submitted the oil to distillation. The oil obtained had a density of 0.872, and its left-handed deviation, for a column of 100 millimètres was 36°.

5. *Oil of Bordeaux turpentine, rectified with water. Second and ulterior products.*—The last portions of oil obtained by distilling the oil with water, were feebly yellow, less fluid than the first products, and, when poured out, a little filamentory. Its density was 0.889 at 48° Fahr.; and its left-handed deviation 26° for a column of 100 millimètres.

"It results from these experiments," says M. Guibourt, "that the oil of Bordeaux turpentine contains at least two oils of different densities and volatilities, and which do not act equally on polarized light; the last product of rectification acting much less feebly than the first. The unrectified oil, consequently, ought to produce a left-handed deviation intermediate between the first and the last rectified product."

6. *Strasburg turpentine; turpentine of the silver fir* (*Abies picea*, or *Abies taxifolia*). It had a citron odour, was quite transparent, almost liquid, and had a pale yellow colour. It was examined in a square flask. It had a left-handed rotation of 5° for a thickness of 70 millimètres [=2.75 English inches.]

7. *Oil of Strasburg turpentine,* obtained by distillation from the preceding turpentine. Its specific gravity at 53.6 Fahr. was 0.861. Its left-handed rotation at the temperature of 59° Fahr., for 100 millimètres, was 13°2 for the flax-flower tint.

8. *Larch turpentine; genuine Venice turpentine; turpentine of Larix Europæa.* Left-handed rotation 5°9.

9. *Oil of balsam of Canada,* obtained by distilling balsam of Canada without water. Rotation left-handed, for a column of six inches, 35° for the flax-flower tint.

10. *Resin of Balsam of Canada.*—Rotation left-handed.

2. RIGHT-HANDED OR DEXTRO-GYRATE TURPENTINES.

1. *Rectified oil of turpentine of English commerce, obtained from American turpentine, the produce of Pinus palustris* chiefly, and *Pinus tæda.*

Its density at 53.6 Fahr. was 0.867. Its right-handed rotation for a column of 108 millimètres [= 4.25 English inches], at a temperature of 59° Fahr., was 22° 5, for the violet blue tint, and for the rays transmitted by red glass, from 16° 9 to 17°.

2. *Balsam of Canada*, obtained from *Abies balsamea.* In a cylindrical vessel of about 50 millimètres [=1.96 English inches] in thickness, its right-handed deviation was 6°.

I have subsequently examined balsam of Canada, from several sources, and find them all right-handed.

"This opposition (in the optical properties of the two balsams obtained respectively from *Abies picea* and *Abies balsamea*) is," says M. Guibourt, "very remarkable, on account of the great affinity which exists between the trees, as well as of the remarkable similarity which exists between the chemical properties of the two balsams."

ON SOME VEGETABLE AND MINERAL PRODUCTIONS OF NEW ZEALAND.

Dr. Pereira laid before the Committee specimens of some vegetable and mineral substances recently brought from New Zealand, and which he had received from Mr. W. Brown, formerly of that country, and who was desirous of ascertaining their properties and commercial value. Dr. Pereira arranged them in natural historical order, and appended a few observations to each.

1. MINERALS.

The mineral substances consisted of *native sulphur*, from White island; a substance commonly called *magnesia*, and said to be dug out of the ground in the neighbourhood of Auckland; *black oxide of manganese* from the isle of Waiheke, *copper ore* from the island of Kawau, and *brown coal.*

The substance erroneously denominated *magnesia*, is a soft, white, light mass of siliceous animalcules. It has been examined microscopically both by Mr. Bowerbank and Mr. H. Deane, the former of whom states that it consists of several species of *gallionella*, a few species of *navicula*, and others, intermixed with a small quantity of sand. I understand that a similar error was made in America; an animalcular mass of silica being mistaken and used for magnesia !

2. VEGETABLES.

The vegetable substances have been arranged according to the natural orders of the plants yielding them.

1. *Smilaceæ*, R. Brown.—Specimens of the cut stems, the leaf, berry, and extract of the stems of a plant called by the

natives *kareao*, the *Ripogonum parviflorum* of Robert Brown. (See Allan Cunningham, in *Hooker's Companion to the Botanical Magazine*, vol. ii). It is said to possess similar virtues to those of sarsaparilla, a statement by no means improbable, considering that it belongs to the same natural family as the genus Smilax. Should experience confirm the truth of the statement, the plant might be conveniently called *New Zealand sarsaparilla.* The stems are said to yield 12 per cent. of extract. The specimen of extract furnished me is slightly bitter, and contains starch-gum and traces of astringent matter.

2. *Coniferæ*, Lindley.—The *cowdie-pine resin,* also known as *kouri resin,* or *cowdie gum*, is obtained from a coniferous plant, growing exclusively in the northern portion of the Northern Island. It is the *kouri* or *kauri* of the natives, the *Dammara australis* of Don, and *Agathis australis* of Salisbury. A botanical description of this tree is given in Mr. Lambert's second edition of his splendid work on the genus *Pinus,* and also in Loudon's *Arboretum et Fruticetum Britannicum,* vol. iv.

The resin exudes from the stem spontaneously, and by incision (Bennett, *London Medical Gazette*, vol. ix, p. 149). It is also found underground in various parts of the same island, where the pine trees now no longer exist. My informant, Mr. W. Brown, tells me that he has found it at the depth of at least two feet. Dieffenbach (*Travels in New Zealand,* vol. i. p. 201, 1843) also alludes to the existence of this resin scattered over the surface of the ground in certain parts of the Northern Island, where, in not very remote times, the cowdie pine must have grown, though it is now no longer found there. The resin which has exuded from the stems of trees now in existence, has a more or less milky or opalescent appearance, and in the more recent specimens is somewhat odorous; whilst those samples which have been buried in the earth are transparent, more nearly resemble amber in colour and appearance, and are quite devoid of odour. The American dealers prefer the latter sort. Some years ago, this resin was described by Mr. Prideaux (*Lond. and Edinb. Phil. Mag.*, vol. xii., p. 249, 1838). His examination of it had a special relation to its employment in the arts; and he suggested its applicability to the manufacture of varnishes, sealing wax, and resin gas for the purposes of illumination.

It is extensively employed, I am informed, by the Americans, who purchase it at New Zealand. Mr. Darwin (*Narrative of the surveying Voyages of Her Majesty's Ships Adventure and Beagle,* vol. iii., p. 510, 1839), says, that it is sold to them at a penny the pound, but that its use is kept secret. Mr. Wm. Brown, however, informs me that they readily purchase it at New Zealand at £16 per ton ; and on one occasion, a captain gave £45 per ton for it. He understood that it was employed in America, as a substitute for copal, in the manufacture of varnishes; not to the entire exclusion of the latter resin, but mixed with it, in the proportion of one part copal to three parts cowdie resin.

Recently Dr. R. D. Thomson (*Lond. Edinb. and Dubl. Phil. Mag.*, vol. xxiii., p. 81, 1843) has submitted cowdie resin to chemical examination, and found that it consists of two resinous substances, the one acid, and called by him *dammaric acid;* the other neutral, and termed *dammaran*. The first is soluble in weak alcohol; while the second is insoluble in weak alcohol, but is soluble in absolute alcohol. The formula for the entire resin, as well as for *dammaran*, is $C_{40} H_{31} O_6$; while that for *anhydrous dammaric acid* is $C_{40} H_{30} O_6$.

3. *Taxaceæ*, Lindley.—The collection given me by Mr. W. Brown contains two substances belonging to the family *taxaceæ*.

One of these is called by the natives *Tanekaha*. It is the *Phyllocladus trichomanoides* of Don. Specimens of the bark leaf, and extract of the bark, have been sent. The bark is used in dyeing red. Mr. W. Brown tells me that boat sails are dyed with it to preserve them. One pound of the bark is said to yield sixty-three grains of tannin.

The extract given to me by Mr. Brown has a beautiful ruby red tint; its taste was astringent. Its solution in water produces with gelatine a precipitate, and with the persalts of iron a dark green colour.

The other taxaceous plant is that called by the New Zealanders *Rimu*. It is the *Dacrydium cupressinum* of Solander. Specimens of the bark, branch with leaves, exudation (which is said to resemble *kino*), and extract of the bark have been sent. One pound of the bark is said to yield eighty-five grains of extract.

4. *Saxifragaceæ*, De Candolle.—To this order belongs the plant, called by the natives of New Zealand *Towai;* by Don, *Leiospermum racemosum;* by De Candolle, *Weinmannia racemosa*. (See Allan Cunningham, in the *Annals of Natural History*, vol. ii., p. 358). Specimens of the bark, extract of the bark, and leaf have been sent. The bark is in long pieces, which by a superficial observer might be confounded with red cinchona bark. It is supposed to be valuable for the purposes of the tanner, and is said to yield 104 grains of tannin for every pound of bark.

5. *Meliaceæ*.—Specimens of the wood with the bark, of the leaf, and extract of a plant, called by the natives *koa-koa*. It is the *Hartighsia spectabilis* of De Candolle. It is said to possess the properties of gentian, and to have been substituted

for hops in the manufacture of beer. The leaves yield a very bitter extract.

6. *Myrtaceæ*, De Candolle.—The plant called by the natives *Pohutu-kawa* is the *Metrosideros tomentosa* of Richard, the *Callistemon ellipticum* of Allan Cunningham. (*Annals of Natural History*, vol. iii., p. 113). Specimens of the wood, with the bark, and of the leaf, have been sent. It is thought that the bark may be useful for tanning: one pound of it is said to yield sixty grains of tannin. Mr. W. Brown tells me that this bark is supposed to contain an alkali.

7. *Elæocarpeæ*, Jussieu.—The tree called by the New Zealanders the *Hinau*, is the *Elæocarpus hinau* of Allan Cunningham, (*Annals of Natural History*, vol. iv., p. 23); the *Dicera dentata* of Forster. A large log, forming a portion of the stem, and a specimen of the bark, of the leaf, and of the extract, have been sent. The bark is used by the natives for dyeing black. A watery solution of the extract produces a precipitate with gelatine, and a blueish black colour with the salts of iron. The New Zealand flax (*Phormium tenax*) is first steeped in a decoction of the bark, by which it acquires a brownish tint, and is then placed in *mud* which strikes a fine black colour. Specimens of the raw flax, of the flax which had undergone the first stage of dyeing black, of the ferruginous mud or earth, and of flax dyed black, have been sent. Mr. W. Brown states, that the flax cultivated by the natives for the manufacture of their finer kind of mats, is very superior to the coarse kind of flax which grows wild, and which they have usually supplied to Europeans.

Uncertain. A sweetish astringent bark, called by the natives *Towai* (not the *Weinmannia racemosa* beforementioned), has been sent, but nothing could be made out respecting its natural history.

ORIGINAL AND EXTRACTED ARTICLES.

TEST FOR ADULTERATIONS IN DISULPHATE OF QUININE.

BY J. BIRKBECK NEVINS, M.B.

A SAMPLE of suspected disulphate of quinine having been sent to me for examination, I was induced to seek a more simple test for the presence of sugar than the one usually proposed. When the salt is dissolved in dilute sulphuric acid, and the alkali precipitated by means of liquor potassæ or ammonia, the direction generally given is, to evaporate the solution, and taste whether or not it is sweet. If however, the quantity of sugar is small, the sulphate of potash or ammonia might so obscure the flavour as to render this evidence of its presence uncertain, and it must be admitted that a sweet taste is a very imperfect chemical test. In order to avoid the interference of the saline flavour, Pereira advises to boil the dry residuum in alcohol, which will dissolve the sugar and leave the sulphates unaffected; but whoever has tried this plan, especially if he has operated upon but a small quantity, will have found it troublesome and unsatisfactory. The following test is both simple and delicate:—

To one or two grains of the suspected salt add three or four drops of sulphuric acid, in a white evaporating dish, and twice as many drops of water. If the salt contains either fatty matters or starch, these will remain; whilst if they are absent the whole will be dissolved. Let heat be next applied to the solution, and as it becomes concentrated, the acid will char any sugar which may be present, which will be indicated by a black stain round the edge of the solution, and the whole will speedily assume the same colour. By this means one or two per cent. of organic matter may be recognised in as many minutes without trouble. It is said that salicine is an occasional adulteration, and if present it is detected by the same proceeding. If a very minute quantity only is mixed with the quinine, blood-red points, and ultimately a general reddish colour are produced, as the concentration proceeds. It is a good plan to observe the effect of the sulphuric acid before the addition of water, as it acts upon the salicine in the cold, producing the blood-red colour. Thus the single test of sulphuric acid, diluted and heated, detects nearly every impurity which is found in the disulphate; for starch, fatty matters, and insoluble earthy salts are left undissolved before the application of heat, and salicine, gum, and sugar are shown by the effects of heat upon the solution. It is supposed that sulphate of cinchona has lately been often mixed with the quinine; but if this is the case, it is a fraud of very little consequence, as there does not appear to be any sufficient medicinal reason for the preference of the quinine to the cinchona salt. Pure disulphate of quinine is not affected by the sulphuric acid applied as above.

Falkner Street, Liverpool, June 7th, 1845.

EXAMINATION OF THE OIL OF MUSTARD (*Sianpis nigra*).

BY WILL.

The chief result of these experiments is, that if we regard with Wertheim the oil of garlic as a sulphuret of allyl $C_6 H_5 S$. then the oil of mustard is a sulphocyanic combination with allyl$=C_6 H_5 (C_2 N S_2.)$ With hydrate of potash the author obtained a combination of sulphocyanuret of allyl with sulphuretted hydrogen ($C_6 H_5 C_2 N S_2 + S_2 H_2$), analogous to the double salt of sulphuretted hydrogen and sulphuret of cyanogen, described by Zeise. In its relation to bases, the oil of mustard bears a striking resemblance to the sulphocyanic compounds, for it parts with sulphur and carbon in the proportions of sulphuret of carbon, and forms a series of new substances with basic properties. Among the products generated by the action of the metallic oxides on the oil of mustard, may be mentioned *sinapolin*, formed by the action of recently precipitated oxide of lead, or by that of an aqueous solution of barytes when sulphuret of carbon escapes from the oil of mustard, but is immediately converted into sulphuretted hydrogen and carbonic acid, so that 2 $C_8 H_5 N S_2$, with 6 Pb O and 2 H O, may yield 4 Pb S, 2 Pb O C O_2, and lastly *sinapolin*=$C_{14} H_{12} N_2 O_2$, which has taken up H O in place of C S_2, which have escaped. The decomposition with potash is far more complicated. The oil of mustard enters into direct combination with ammonia: the compound has an alkaline character, and has been termed *thiosinammin*=$C_8 H_8 N_2 S_2$. By oxide of lead all the sulphur may be driven off the thiosinammiu in the form of sulphuretted hydrogen when a base free from all sulphur is obtained, *sinammin*=$C_8 H_6 N_2$. The oil of mustard contains, as Löwig has observed, no oxygen; it consists of—

C.	49.11 ……	48.68	8 =	600.00 ……	48.37
H.	5.24 ……	——	5 =	62.39 ……	5.03
N.	14.12 ……	14.12	1 =	175.82 ……	14.17
S.	32.11 ……	31.81	2 =	402.33 ……	32.43
				1240.54	100.00

The specific weight of the vapour was found to be=3.54.

We annex a tabular view of the substances obtained in this analysis, with their formulæ:—

Oil of Mustard, or *Sulphocyanuret of Allyl* $C_8 H_5 N S_2$
Thiosinammin, or *Ammoniated Mustard Oil*, $C_8 H_8 N_2 S_2$
Thiosinammin-Chloride of Platinum $C_8 H_8 N_2 S_2$, Cl H + Pt Cl_2.
Thiosinammin-Chloride of Mercury, $C_8 H_8 N_2 S_2$ + 4 Hg Cl.
Sinammin $C_8 H_6 N_2$.
Hydrate of Sinammin $C_8 H_6 N_2$ + H O.
Sinammin-Chlor. Platin $C_8 H_6 N_2$, 2 Cl H+2 Pt. Cl_2.
Sinammin-Chloride of Mercury, $C_8 H_6 N_2$ + 2 Hg Cl.
Sinapolin $C_{14} H_{12} N_2 O_2$.
Hydrochlorate of Sinapolin $C_{14} H_{12} N_2 O_2$+Cl H.
I. *Oleaginous Substance* (hypothetical) $C_{14} H_{14} N_2 O_2 S_2$.
II. *Oleaginous Substance* $C_{28} H_{25} N_3 O_4 S_4$.
Acid in the combination with lead $C_8 H_6 N S_4$.

Pharmaceutisches Central Blatt, Feb. 1845, Nos. 6 and 7.

ON TAMARINDS (*TAMARCHINTI*).

BY X. LANDERER, OF ATHENS.

Every Pharmaceutist knows that the tamarind pulp of commerce is contained in a broad pod of the length of a finger, with three or six indentations. These pods are opened in Arabia, the native country of the tamarind tree; the pulp is there removed, trodden down in a kind of wooden tub, and afterwards formed into roundish cakes, weighing from fourteen to sixteen ounces, and dried in the sun. In this state it is brought to Cairo, where it is sold, the trade not being a monopoly of the viceroy. Even in Egypt all the pulp sold in cake is regarded as adulterated, so that the higher classes purchase only the unopened pods for use. The quantity of tamarind pulp brought into the market of Cairo and Alexandria, varies from 8 to 10,000 cwt., reckoning the cwt. at 36 okkas.—*Repertorium für die Pharmacie*, Band xxxvii., Heft 2.

ON A NEW METHOD OF PREPARING MEDICATED TINCTURES.

BY HENRY BURTON, M.D.

Physician of St. Thomas's Hospital.

(From the Medical Gazette.)

In a paper published in the *Medical Gazette* for August 1844, "On a new Method of making Medicated Tinctures," I ventured to propose a deviation from the ordinary plan of agitating the solids in direct contact with their spirituous solvent, and suggested the interposition of a bag, in which they might be suspended and macerated in the spirit without agitation.

The principle on which the process is conducted was stated in my paper to have been long familiar to scientific chemists, and I may add, had been often applied by them to the dissolution in particular of saline compounds, either suspended by means of a linen bag, or a perforated metallic plate. The application of this principle to the preparation of medicated tinctures, and the use of a bag to serve the two-fold office of suspending the solid, and of filtering the tincture as soon as formed, I considered a novelty, and have not met with any account of its previous application to a similar purpose. I have, however, recently had the pleasure of reading the remarks of Mr. Bell, the experienced Editor of the *Pharmaceutical Journal*, on my paper in the April number of that useful periodical, by which I was first apprized of Mr. Alsop having several years ago used "a perforated diaphragm or plate, fixed above the middle of a jar, on which the ingredients for making infusions were placed." A similar arrangement to this was likewise proposed by me, in ignorance of Mr. Alsop's paper, as being occasionally serviceable in making tinctures as well as infusions; but, since that suggestion was made, I have found this arrangement frequently inapplicable, and that while it will only answer satisfactorily in preparing a few, it is objectionable in making the majority of the officinal tinctures. I do not, therefore, recommend the use of either perforated plates, or sieves of any material, in these processes, and the results exhibited on the subjoined table were all obtained from experiments made with bags.

I am happy in believing the plan under consideration is likely to attract the notice of experienced operators, through the medium of the *Pharmaceutical Journal*, and feel confident it will be found much more generally applicable than is anticipated by the Editor of that periodical. But before any correct opinion can be formed of its merits, comparative experiments should be performed on large and small quantities of similar materials, macerated together respectively by the old method and the one suggested as its usual substitute, and the results carefully noted.

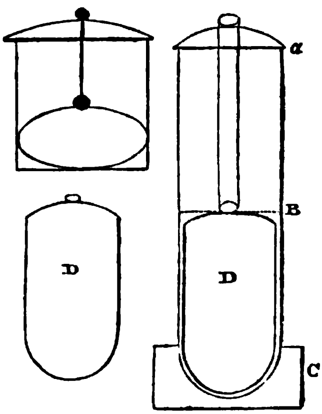
With the desire of arriving at accurate conclusions, I have greatly multiplied my comparative experiments on small quantities; and by the kind assistance of Mr. Whitfield, the apothecary of St. Thomas's Hospital, I have likewise been enabled to perform several experiments on large quantities of the requisite materials, since the bag process was proposed. The results of these numerous experiments induce me still to adhere to the opinion I have already expressed of its great eligibility, and to continue in the belief that, with certain precautions to be hereafter pointed out, almost all the medicated tinctures may be prepared by the new plan, of equal strength to the corresponding tinctures made by the old plan, with less risk of incurring a loss of strength by inattention to the degree and repetition of the agitation which is requisite on the old plan, with less labour, and also a less expenditure of spirit. I am, however, bound in candour to add, that although the bag process may be advantageously followed in preparing almost all the tinctures, yet it has proved more eligible in some tinctures than in others, and the remarks which follow the subjoined table of results will explain the circumstances in particular which were supposed to influence its degree of eligibility; but none of them seem to possess an importance sufficiently great to justify a condemnation of the process without reference to comparative experiments, and least of all the circumstance of the bulks of the solids employed being variable; no material difficulty is to be apprehended on the score of bulk, although the variation is sometimes very considerable, as, for instance, between the bulks of kino and of hop, both of which are directed to be macerated in equal quantities of spiritus tenuior. This variation, however, demands attention, and must be provided for by the operator; but it is not a circumstance which interferes with the effectual maceration of bulky substances, not even of the most bulky, as hop. Now, when the bulk of the hop is compared with that of the proportional quantity of the spirit in which it is directed to be macerated, its effectual maceration seems to be at first sight impossible; but the impossibility is apparent only and not real, and the seeming difficulty may be easily surmounted by modifying the shape and dimensions of the bag, and adapting them to those of the vessel in which it is to be suspended. When this adaptation is properly effected, all the substances without exception may be effectually covered by, and efficiently macerated in, the proportional quantity of spirit.

But in my former paper on this subject, the use of a conical vessel was suggested, and the shape of the bag was that which would result from enclosing a substance in fragments in a piece of linen or calico with strings, or a modification of the sphere; and with this arrangement, about thirty-seven of the officinal tinctures may be conveniently prepared; but the remaining eight or nine tinctures being made with very bulky solids, cannot be efficiently macerated in this form of apparatus, but require for the purpose a modification of it, as above noticed, and in which it will be practicable to immerse the solids, without being subjected to forcible compression, in the proportional quantity of spirit.

Whether the vessel be conical or cylindrical, is immaterial, provided it has the requisite capacity; but the bag, when the conical vessel is used, should be likewise conical; and when the cylindrical vessel is preferred, oblong. Their relative dimensions in both cases must be such, that no more space be left unoccupied by the bag, when loosely packed with the dried solid and introduced into the vessel, than is sufficient to allow for the expansion caused by the absorption of spirit by the solid, and sufficient also to admit of the interposition of a thin stratum of the spirit, which remains unabsorbed between the sides of the expanded bag and the interior sides of the vessel. If this adaptation is made with common care, a free circulation of the resulting tincture will be insured, as its density varies; and an exceedingly thin stratum of interposed spirit will suffice. The bag having been prepared by the sempstress under directions, is to be filled with the substance, previously reduced to the state of disintegration directed in the London Pharmacopœia, and allowed to fall into the bag by its own gravity without the application of additional pressure, except in the examples of hop, hyoscyamus, and conium, in packing which, but particularly hop, a moderate degree of pressure will be required to contract their bulks within the requisite limits.

The bag is next to be closed, a little above the solid, by string, and finally immersed in the proportional quantity of spirit previously introduced into the macerating vessel; and with an apparatus resembling in its proportions that in the annexed sketch, to the exclusion of the conical vessel, all the officinal tinctures may be conveniently prepared.

The sketch is too simple to require explanation, but it is proper to observe, as a general guide in making the arrangement and in conducting the process, that, with reference to cylindrical vessels of the requisite capacity, their height should always rather exceed twice the height of the packed bag, so as to allow of it being raised under cover, and drained above the surface of the tincture. The diameter of the vessel does not materially influence the process when small quantities of solids are macerated; but when large quantities are employed, a vessel of a larger diameter, and shallower than that represented on the sketch No 1, with a bag to correspond, and made so as to expose as extended a surface of the solid as possible to the action of the solvent, with the least depth, would be preferable to the oblong bag, as being more favourable to the perpendicular circulation of the tincture through the solid, as in the sketch No. 2.



But while, on the one hand, by an apparatus of the kind suggested, the bulks of the substances to be macerated in it is a circumstance of secondary moment; on the other, their chemical nature and state of aggregation continue to exert considerable influence over the process, and materially affect the rate of circulation through them. The circulation of the resulting tincture, for instance, varies with the solubility and porosity of the solid immersed in the spirit, as well also as with the nature of the insoluble residue left in the bag: thus, when the substance is very soluble, and contains a very small proportion of matter insoluble in spirit, as kino or guaiacum, the rate of circulation is comparatively rapid;—so, also, when the substance is very porous, its extractive very soluble, and its insoluble components are likewise very porous, as in the examples of cinchona, hop, and conium, the rate of circulation is rapid, and the process goes on very favourably. But if the substance becomes viscid when saturated with spirit, as squill, and the residue is abundant and gummy, as that of jalap, opium, myrrha, and asafœtida, or is feculent, as that of liquorice, then the rate of circulation, although rapid for some hours after the solids have been thoroughly saturated with the spirit, will become languid towards the close of the maceration, and will require to be stimulated by the interference of mechanical aid.

With the object, therefore, of quickening the circulation of the solvent through the majority of the solids used in making tinctures, the packed bag should be raised, and drained under cover, after it has been immersed in the spirit for one or two days, and again lowered as soon as the tincture has entirely ceased to drain from it. This alternate raising and lowering will have the effect of restoring animation to the circulation of the tincture stagnating in the centre of the congested solids, and should be repeated daily during the process of maceration.

This process is usually perfected in two to four days, when small quantities of the respective ingredients are used, as, for instance, an ounce of a solid, and its proportional measure of spirit; but is protracted two or three days when large quantities of similar materials, as eight pounds of cinchona and three gallons of spirit are macerated together. The influence of quantity, although evident, is nevertheless much less marked than that of the chemical nature of the substance under treatment with spirit; and by no process of maceration can the original affinities between the components of different substances be invariably subverted by the spirituous solvent in equal intervals of time. Some are more readily overcome than others under similar conditions, and this inequality of interval is rendered very apparent when the same kind of substance is macerated in different states of aggregation, and at different temperatures. It is necessary, therefore, to attend to these conditions, with the object not only of abbreviating the duration of the process, but likewise of insuring the exhaustion of the solid, and the uniform strength of the tincture. And generally, a substance in mass cannot be dissolved by spirit at a lower temperature so quickly as when the same kind of substance, being reduced either to fine or coarse powder, is macerated at a higher temperature. It is, moreover, probable that the components of some substances are extracted at the higher, and not at the lower temperatures; for instance, a stronger and better tincture may be prepared by macerating the materials together at a temperature of 65° to 70°, than with similar materials used at a temperature of 50°; and I believe no extension of the time of macerating them at the lower degree would compensate for the deficiency of heat. The quality of the solids, whether good or bad, as well as the states of dryness in which they are used, are other circumstances which also influence the strength of the tinctures made with them, and should be taken into calculation in comparing the results of any experiments together. Now the conditions under which drugs are used vary greatly, and, in consequence, the results on the subjoined table may not exactly correspond with those obtained from similar drugs treated in the same way by other experimentalists, and if compared together would lead to erroneous conclusions; but, in making my own comparative experiments, I have endeavoured to obviate this source of fallacy, by comparing together the results obtained from different portions of the same parcels of the respective drugs only, and not of different parcels. The drugs were for the most part of good ordinary quality. The spiritus tenuior had a specific gravity of 0.920, and the spiritus rectificatus 0.838 at 62°. The materials were put together in the proportions, and uniform states of dryness and aggregation, as they are directed to be in the London Pharmacopœia; the quantity of each macerated was almost equally small, and the temperature of the room the same. Great care was taken to prevent evaporation, and several comparative experiments were made with the different substances named on the table before the results were considered to be accurate.

The process was supposed to have been completed as soon as the tincture had ceased to acquire weight; and its specific gravity viewed in conjunction with the weight of hard extract, obtained by evaporating one fluid drachm of it in an American oven, at a temperature of about 230°, was considered a measure of its strength, in reference at least to substances not volatile at that temperature.

But the specific gravity, taken alone, could not always be depended on, since, independent of the presence of active ingredients in the drugs, it varied much more with the quantity of water in them, and their states of dryness.

It varied also with the degree of force applied to express the last portions of tincture from the bag; and, in general, when the residue was abundant, the specific gravity of the expressed tincture was heavier than that of the drained tincture; but the quantity of hard extract did not always vary in the same proportion, nor was the specific gravity invariably augmented by pressure.

TABLE showing the Results of Experiments performed on the Officinal Tinctures of the London Pharmacopœia; with the object of comparing the efficiency of the Process of Maceration with the mediate contact of the Materials employed, or of the Bag Process; with that of Maceration with their direct contact, or of the ordinary process.

NAME OF TINCTURES.	Time of Maceration in Days.		Maximum Specific Gravity at 62° of each Tincture.	Weight of Hard Extract from One fluid Drachm. of each Tincture	
	Direct.	Mediate		Grains.	
Tinctura Aloes 1	14	—	0.994	2.85	Made with bad liquorice and diluted spirits, weaker than spiritus tenuior.
“ “ 2	—	2	0.990	—	
“ “ 3	—	2	0.996	—	Made with good liquorice, ditto, ditto.
“ “ 4	—	2	0.999	4.4	
“ “ 5	14	—	0.980	1.45	Made without liquorice, ditto, ditto.
“ “ 6	—	2	0.980	—	
Tinct. Aloes Comp.	—	2	0.898	7.5	Made without crocus, and with the tincture of myrrha, sp. gr. 0.841.
Tinct. Asafœtidæ	7	—	0.864	4.8	Made with two portions of one kind of asafœtida.
“ “	—	2	0.860	3.75	
“ “	—	8	0.8602	—	Made with one portion of the same kind as the above.
“ “	3	—	0.8608	4.0	
Tinct. Balsami Tolutani	2	—	0.856	—	Made with two portions of the same parcel.
“ “ “	—	2	0.836	2.88	
Tinctura Calumbæ	3	—	0.925	0.35	Made with the same kind of calumba.
“ “	—	2	0.925	—	
Tinctura Cascarillæ	—	2	0.926	0.55	Made with the same kind of cascarilla.
“ “	10	—	0.926	0.55	
Tincture Catechu	—	2	0.949	—	Made without cinnamon.
Tinct. Cinchonæ Pallidæ	10	—	0.945	—	Made with one kind of pale cinchona.
“ “ “	—	3	0.945	3.2	
“ “ “	—	3	0.939	2.9	Made with another kind of pale cinchona.
“ “ “	—	4	0.938	2.8	
Tinctura Conii	—	1½	0.933	1.6	Made with leaves picked, crisp, greyish green, and odorous.
“ “	7	—	0.932	—	
Tinctura Digitalis	14	—	0.934	—	Made with leaves cauline, picked, crisp, greyish green, and odorous.
“ “	—	2	0.934	2.85	
Tinctura Guaiaci	—	2	0.883	—	Made with bad guaiacum.
Tinctura Hyoscyami	8	—	0.933	1.9	Made with picked leaves, crisp, greyish green, and odorous.
“ “	—	4	0.933	1.9	
Tinctura Jalapæ 1	14	—	0.941	4.0	Made with the same kind of jalap, according to P. Lond.
“ “ 2	—	3	0.941	—	
“ “ 3	—	3	0.940	2.1	Made with half the proportion of jalap directed in P. Lond.
“ “ 4	14	—	0.940	—	
Tinctura Kino	14	—	0.874	—	Made with two portions of one kind of kino.
“ “	—	1½	0.874	4.0	
“ “	—	1	0.880	4.3	Made with another kind of kino.
“ “	—	1	0.882	4.5	Made with a third kind of kino.
Tinctura Lupuli 1	8	—	0.933	1.7	Made with two portions of one kind of hop.
“ “ 2	—	1	0.934	1.7	
“ “ 3	1	—	0.932	—	Made with two portions of another kind of hop.
“ “ 4	—	1	0.933	—	
Tinctura Myrrhæ 1	—	2	0.8430	1.20	Made with two portions of one kind of indifferent myrrha.
“ “ 2	20	—	0.8436	1.27	
“ “ 3	182	—	0.8451	0.80	Made with two portions of one kind of best myrrha.
“ “ 4	—	2	0.8420	—	
Tinctura Opii 1	14	—	0.988	2.25	Made with two portions of one kind of opium.
“ “ 2	—	5	0.987	2.00	
“ “ 3	6	—	0.989	—	Made with one portion of another kind of opium.
“ “ 4	—	6	0.989	2.8	
Tinctura Scillæ 1	14	—	0.958	5.35	Made with two portions of one kind of squill.
“ “ 2	10	—	0.955	4.85	
“ “ 3	8	—	0.954	4.00	Made with one portion of another kind of squill.
“ “ 4	—	8	0.954	—	
“ “ 5	10	—	0.961	5.45	Made with two portions of the same kind of squill as Nos. 3 and 4, but more dried, and at a subsequent period.
“ “ 6	—	10	0.961	5.50	
“ “ 7	—	5	0.956	—	
“ “ 8	—	12	0.956	4.9	Made with another kind of squill.
Tinctura Valerianæ	—	2	0.932	1.2	

I have endeavoured in the preceding remarks to point out the chief precautions which seem requisite to insure an uniformity in the results obtained by macerating substances suspended in spirit, and I trust they will serve to invite the attention of experienced Pharmaceutists to the subject. The observations which follow the above table are of a more particular character and are intended to point out the events which occurred in making the tinctures named on it with small quantities of the requisite ingredients. The same observations, so far as my experience allows me to form an opinion, will apply correctly to the preparation of similar tinctures made with large quantities; but having hitherto made only a few experiments on very large quantities, it would be premature to notice their results in detail in my present communication. (*To be continued.*)

ON THE CHASCHISCH OF THE ARABS (CANNABIS SATIVA OR HEMP).

BY ADOLPH STEEZE,
Court Apothecary at Bucharest.

HADSCHY is not the correct term for this narcotic drug, for Hadschy means a *pilgrim*; the true name is, according to pronunciation, *chaschisch*, the Arab word for *hemp* (*Cannabis sativa.*) By this name all intoxicating drugs, whose chief constituent is this herb, are well known over the whole of the East. The mode of preparing chaschisch is the following:—

The tops and all the tender parts of the hemp-plant are collected after the period of inflorescence, dried and kept for use. It must be premised that the hemp-plant is in the east distinguished by its narcotic properties, although botanists are unable to detect any difference between this and the European species. The dried hemp, or chaschisch, is used

(1) Boiled in fat butter or oil with a little water: the filtered product is employed in all kinds of pastry.

(2) Powdered for smoking. 5 or 10grs. of the powder are smoked from a common pipe (*tsubuk*) with ordinary tobacco (*tütün*), or from a water pipe (*nargiele*) with another kind of tobacco (*tombeki*)[*].

(3) Formed with tragacanth mucilage into pastiles, which are placed upon a pipe and smoked in similar doses. These two last preparations are also termed *esrar*:[**] they are the most active of all the preparations of chaschisch, and the first pipe will cause cerebral congestion in beginners.

(4) Made into an electuary with dates or figs and honey. This preparation is of a dark brown almost black colour, and tastes of dates and hemp; it is less active than the esrar.

(5) Lastly, another electuary is prepared with the same ingredients with the addition of spices: cloves, cinnamon, pepper, amber, and musk. This preparation is used as an aphrodisaic.

Chaschisch is said not to produce stupor but the most pleasant species of intoxication. The person under its influence feels with perfect consciousness in the best of humours; all impressions from without produce the most grateful sensations: pleasant illusions pass before his eyes, and he feels comfortably happy; he thinks himself the happiest man on earth, and the world appears to him Paradise. From this imaginative state he passes into the every-day state, with a perfect recollection of all sensations, and of every thing he has done and of every word he has spoken. The effects of a continued use of the narcotic are emaciation and nervous debility.—*Repertorium für die Pharmacie*, Band xxxvii., Heft 2.

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[*] The tombeki is probably the leaf of a species of Lobelia; it is smoked in a nargiele, and is uncommonly narcotic; so much so, that it is ordinarily steeped in water for a few hours before it is used to weaken it, and the pipe is charged with it whilst it is yet wet.

[**] *Esrar* is the Arab word for a "*secret.*"

ON SENNA.

BY X. LANDERER, OF ATHENS.

The senna plant is chiefly indigenous in Ethiopia, Arabia Felix, Abyssinia, Nubia, and Sennaar. The Arab tribes who occupy themselves with this branch of commerce pay not the slightest attention to the cultivation or management of the plants. The senna plant attains the height of eight or ten feet, and affords some protection against the heat of the sun to the inhabitants of the desert and to the caravans. The harvest of senna begins about the end of September. The Arabs then cut nearly all the branches off the tree, leaving the stems bare, and allow them to lie exposed until the leaves begin to fade. The branches are now collected in bundles and exposed on high ground or rocks that the air and sun may dry them as quickly as possible. When the leaves are dry the branches are laid in heaps and beaten with sticks to shake the leaves off. The leaves obtained by this process are not damaged, and consequently fetch the highest price, amounting to about double the sum given in the bazaars for the broken senna. As all the leaves are not separated from the twigs by this process, the branches are, in some parts of Nubia, placed on a clay floor and camels are driven over them to effect the total separation of the leaves, which are by these means broken into pieces and found mixed with small portions of the twigs.

Another variety of senna, characterised by the large size of the leaves and their green colour, is brought from the interior of Africa. It is sold at a high price by the name of *Mekka senna.*

The senna (*sinamiki*) collected in various parts of Africa, is packed in linen sacks on camels and conveyed by caravans to the shores of the Nile, where it is transferred to the boats, and thus brought to Cairo and Alexandria. In these two capitals there are sinamiki magazines, to which the bales are conveyed to be unpacked and again carefully sorted.

Within the last two years the senna trade has been thrown open, but it has latterly again become a government monopoly. The refuse and dust generated by the sorting of the leaves is not met with in the European markets, as it is kept for home consumption. An intentional adulteration of senna with other leaves in their native country is out of the question, for the slightest adulteration is there punished as a capital crime. The small pods, which are rarely found mixed with the leaves because they are carefully picked out, are in very general use in the countries where the senna grows. In the bazaars of Constantinople and Smyrna two varieties are met with—an Egyptian and a Tripolitan variety.—*Repertorium für die Pharmacie,* Band xxxvii., Heft 2.

ON THE YELLOW COLOUR WHICH THE UNGUENTUM IODIDI POTASSII ACQUIRES BY KEEPING.

BY KALLHOFERT.

1. I melted the fat obtained from the viscera of a recently slaughtered pig in vessels of silver, platinum, iron, tin, glass, porcelain, and in glazed earthen vessels, but observed that all the specimens thus prepared bore the same relation to iodide of potassium. All the ointments thus prepared, remained perfectly white during the first four days; but after the lapse of ten days, assumed a yellow colour.

2. Ung. potassii iodidi, when perfectly white, instantly turned yellow on addition of a few drops of the essential oils of lavender, thyme, cloves, and more especially of valerian and cinnamon.

3. Hogslard one ounce, which had been melted about a fortnight previously, gave, with one drachm of iodide of potassium, and six grains of

carbonate of magnesia, an ointment which became yellow and puffy whilst it was being rubbed down.

4. I prepared an ointment of one drachm of iodide of potassium, and fifteen grains of carbonate of magnesia, and one ounce of hogslard, melted 20 days previously, and kept in a well-closed pot. In fifteen hours the cap burst, and the ointment was scattered about, appeared yellow, puffy, and woolly, and showed very little activity when applied to sensitive portions of the skin.

5. One drachm of iodide of potassium, 15 grains of levigated chalk, and one ounce of hogslard (melted twenty days previously). The ointment thus prepared was but slightly discoloured in a fortnight, but appeared to have little activity.

6. One drachm of iodide of potassium, four grains of potassa fusa, and one ounce of old hogslard. In twenty-seven days this ointment was but slightly discoloured, and is tolerably white at present, three months after its preparation.

7. ℞ Olei de Cacao
Ceræ Albæ
Ol. Amygd *ana* ℥ss.
Potassii Iodidi, ℈iv.
Boracis Venet.
Aq. Destill. ā ā ℈j.
Ol. Rosar, gtt ij. M ft. Ung.

This ointment is now at three months from the date of preparation unchanged.

8. ℞ Cetacei, ℥ss.
Ol. Olivæ ʒvi.
Ceræ Albæ ʒij.
Potassii Iodidi, ℈iv.
Ol. Citri.
Ol. Rosar ā ā gtt iij. M. ft. Ung.

Is at present, three months since it was made, not perceptibly yellow.—*Pharmaceutisches Central Blatt*, No. 56.

REVIEW.

PHARMACEUTISCHES CORRESPONDENZ-BLATT FÜR SÜD-DEUTSCHLAND, *herausgegeben von einem Verein süd-deutscher Apotheker. Erlangen, Verlagh von* FERDINAND ENKE.*

THIS periodical of Pharmacy, which appears twice in the month, was commenced in the year 1840. At a Meeting of Apothecaries, held at Bamberz, in Bavaria, a desire was manifested to have a political pharmaceutical paper of local interest, making the pharmaceutists of Bavaria acquainted with the movements of the various societies of pharmacy in their own country, and in the neighbouring states, circulated among them. The society, after this meeting, edited the present publication by the name of *Correspondence Sheet for the South of Germany*. It soon, however, became desirable not to limit the information it conveyed

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*[*Pharmaceutical Correspondence-Sheet for the South of Germany*. Edited by a Society of Apothecaries in the South of Germany. Published at Erlangen by FERDINAND ENKE.]

to the south of Germany, and communications from the north and other parts were admitted.

Strictly speaking, it is a political publication: for the articles it contains are mostly reports of the proceedings of various pharmaceutical societies in southern Germany; and it is really interesting in perusing them to note their very considerable numbers and the variety of names. To these are added all government regulations issued in the various states of Germany, which concern the pharmaceutist, on which the journal furnishes short criticisms and observations.

Its pages are further open to all contributors on pharmacy, with reference to the formation of new regulations for the Pharmaceutist in the south of Germany, the compilation of a new Pharmacopœia, and the arrangement of a new assize for medicines for the kingdom of Bavaria, and the neighbouring states.

Local disputes, squibs, advertisements, a few literary notices, a few observations on the state of Pharmacy in foreign countries, and biographical sketches of defunct pharmaceutists in Bavaria, make up the contents of this journal, whose object, according to the words of the editor, is

> To furnish scientific notices and observations on every thing which may serve to enlighten Pharmaceutists on their position in society—to make them acquainted with the rights of individuals – and to procure for Pharmacy from the public that acknowledgement and regard it has a right to claim.
>
> Hence its chief contents will be not of scientific importance, but the journal will contain :—
>
> 1. Notices of medico-political institutions and orders in the country (Bavaria), and out of the country, especially when they refer to the state of Pharmacy. This head admits of a subdivision into—
>   a. Desires of amendments with reference to the regulations for Pharmaceutists.
>   b. Practical observations of importance and interest as regards the introduction of a new Pharmacopœia.
>   c. Hints and observations for a new assize for medicines.
> 2. Communications on Pharmaceutical meetings, and notices of the discussions.
> 3. Discussions on and proposals for the formation of a new Pharmaceutical Society for the South of Germany.
> 4. Notices, with observations on the state and relations of Pharmacy in foreign countries.
> 5. Notices of persons (more especially biographical sketches of Bavarian Pharmaceutists), of marks of distinction conferred on them, and of changes of the possessors of apothecaries' shops.
> 6. Sales, and offers of sale of shops, chemicals, vegetable drugs, &c. Situations wanted.
> 7. Offers of barter of drugs, plants, or minerals.
> 8. Commercial notices of drugs.
> 9. Literature, or notice of publications of works of pharmaceutical interest, without any attempt at criticism.

Such are the objects of the periodical as detailed by the editors. We have examined the whole of the numbers, extending over a period of five years, and find that the editors have closely adhered to their proposed object, though we must at the same time remark, that the chief bulk of the articles consists of complaints of grievances, oppressions, and disadvantages, under which the pharmaceutists of the south of Germany appear to labour; for every political dissertation with few exceptions puts forth the advantages of the good old times over the present. Many of the communications are exceedingly curious, illustrative of the ill feeling existing between the medical practitioners and the pharmaceutists in Bavaria; but collectively, the medical politics are of local interest. For those who are interested in the state of Pharmacy in Germany, its pages will afford the most explicit information; the articles however are too lengthy to transcribe, and extracts would scarcely be intelligible, unless the whole state of Pharmacy in that country were brought into review. The shorter notices are also of local interest chiefly, but as a political journal, and an advertisement sheet, the *Correspondenz-Blatt* must be valuable in Bavaria.

A few cursory notices of the heads of the articles may perhaps serve to convey an idea of the tendency of the journal. From the first volume we select:—

A plan for a new Assize for medicines, by T. W. C. Martius.

A plan for new regulations for Apothecaries adopted to the present time, more especially for Bavaria.

Petition of the Apothecaries of Augsburg and Suabia for new regulations.

Can the *gens d'armerie* require a reduction of 35 per cent. on the bill for medicines delivered?

Petition of the Apothecaries of Ratisbon for new regulations.

Position of the Apothecaries in Mecklenburgh Schwerin.

From Lower Franconia.—Is the Apothecary bound by law to give credit? What privileges might he claim from the state as a compensation for such an onus?

From Upper Franconia.—The disadvantages of Dispensaries to the public and to the Apothecary.

AN ACT TO ALTER AND AMEND CERTAIN DUTIES OF CUSTOMS.

Whereas by an Act passed in the fifth and sixth years of the reign of her present Majesty, Queen Victoria, intituled *An Act to amend the Laws relating to the Customs*, certain duties of Customs were made payable to her said Majesty, her heirs and successors, upon the goods, wares, and merchandize contained in the tables marked (*A.*) and (*B.*) and schedule, to this Act annexed: And whereas it is expedient that such duties should be repealed: Be it therefore enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, That the duties on the several articles so contained in such tables and schedule shall be and the same are hereby repealed, at the several periods therein specified.

II. And be it enacted, That in lieu and instead of the duties of Customs now payable upon the goods, wares, and merchandize imported into the United Kingdom in the annexed schedule mentioned and set forth, denominated a Schedule of Duties of Customs, there shall be raised, levied, collected, and paid unto her said Majesty, her heirs and successors, upon the respective goods, wares, and merchandize imported into the United Kingdom, the several duties of Customs as the same are respectively inserted, described, and set forth in figures in the said schedule annexed to this Act.

III. And be it enacted, That the duties by this Act imposed shall be under the management of the Commissioners of Her Majesty's Customs, and shall be ascertained, raised, levied, collected, paid, recovered, allowed, and applied or appropriated under the provisions of an Act passed in the third and fourth years of the reign of his late Majesty, King William the Fourth, intituled *An Act for granting Duties of Customs*, and of any other Act or Acts in force relating to the Customs.

IV. And whereas it is expedient that correct accounts may continue to be taken of the value of the imports of certain goods upon which duty has hitherto been charged according to the value thereof, but upon which goods the duties have been repealed by this Act, Be it enacted, That upon the entry inwards of any such goods, the value thereof shall be stated in the entry, and shall be affirmed by the declaration of the importer or his known agent, written upon the entry and attested by his signature, and if such declaration be false, the person signing the same shall forfeit a sum not exceeding twenty pounds; and it shall be lawful for the landing waiter or other officer appointed to examine such goods to call for the invoice, bills of parcels, and such other documents relating thereto as he may think necessary for ascertaining the true value of the same.

V. And be it enacted, That this Act may be altered or amended by any Act to be passed in this session of Parliament.

TABLE (*A.*)

From and after the passing of this Act.

Agates or Cornelians, not set
Alganobilla
Alkali
Alkanet Root
Almonds, Bitter
Aloes
Alum
—— Roch
Amber, rough
Ambergris
Amboyna Wood
Angelica
Annatto
——— Roll
Antimony, Ore of
————Crude
————Regulus of
Argol
Aristolochia
Arsenic
Ashes, Pearl and Pot
———Soap, Weed, and Wood
———unenumerated
Asphaltum or Bitumen Judaicum
Balsam, Canada
——— Capivi
——— Peru
——— Riga
——— Tolu
——— Balm of Gilead and unenumerated Balsam
Barilla
Bar Wood
Bark, Extract of, or of other Vegetable Substances, to be used only for Tanning Leather
—— for Tanners' or Dyers' use.
—— Cascarilla

Bark, Peruvian
—— of other sorts
Basket Rods, peeled and unpeeled
Beef Wood
Berries, Bay
——— Juniper
——— Yellow
——— unenumerated
Birds, Singing
Blackwood
Bladders
Bones of Cattle and other Animals, and of Fish (except Whale Fins) whether burnt or not, or as Animal Charcoal
Box Wood
Borax refined
Borax or Tincal, unrefined
Boracic Acid
Brasil Wood
Braziletto Wood
Brimstone, refined in Rolls
————in Flour
————not refined
Bristles, rough, or in any way sorted
Bronze Works of Art
Bulrushes

Camomile Flowers
Camphor, unrefined
Camwood
Candlewick
Canella Alba
Canes, Bamboo
———Reed
———Rattans, not ground
———or Sticks, unenumerated
Caoutchouc
Cardamoms
Cassia Buds
———Fistula
Castor
Cedar Wood
Chalk, unmanufactured
Chip, or Willow, for Platting
Chesnuts
China Root
Chrystal, rough
Cinnabaris Nativa
Citrate of Lime
Citric Acid
Civet
Coals, Culm, and Cinders
Cobalt
———Ore of
Cochineal
———— Dust
Cochineal Granilla
Coir Rope and Junk, old and new, cut into lengths not exceeding three feet each
Colocynth
Columbo Root
Copperas, Blue
———— Green
———— White
Coral, whole, polished
—————unpolished
———in fragments
Cork
Cotton Yarn
Cubebs
Cream of Tartar

Divi Divi
Down
Drugs, unenumerated

Ebony

Feathers for Beds, in Beds, or otherwise
———Ostrich, undressed
———Paddy Bird, undressed
———unenumerated and undressed
Flax and Tow, or Codilla of Hemp and Flax, dressed and undressed
Flocks
Flower Roots
Fustic

Gallic Powder
Galls
Gamboge
Garancine
Garnets, cut or uncut, not set
Gentian
Ginseng
Glue Clippings, or Waste of any kind, fit only for making Glue
Goods unenumerated, not being either in part or wholly manufactured, not enumerated or prohibited
Grease
Greaves for dogs, and Tallow Greaves
Guano
Gum, Animi
—— Arabic
—— Asafœtida
—— Ammoniacum
—— Benjamin
—— Copal

Gum, Euphorbium
—— Guiacum
—— Kino
—— Lac Dye
—— Mastic
—— Seed Lac
—— Senegal
—— Shellac
—— Storax
—— Tragacanth
—— unenumerated
Gun Stocks in the rough, of Wood
Gypsum

Hair, Camel Hair, or Wool
—— Cow, Ox, Bull, or Elk
—— Horse
—— Human
—— unenumerated
Heath, for Brushes
Hellebore
Hemp, dressed
—— rough or undressed, or any other vegetable substance of the nature and quality of undressed hemp, and applicable to the same purposes.
Hides, not tanned, tawed, curried, or in any way dressed, dry and wet
—— or pieces of Hides, raw or undressed, and unenumerated
—— tails, Buffalo, Bull, Cow, or Ox
—— tanned, not otherwise dressed
Hones
Hoofs of Cattle
Hoops of Wood
Horns—Horn tips and pieces of Horns

Indigo
Inkle, unwrought
Iron, Bloom
—— Cast
—— Chromate of
—— in Bars, unwrought
—— Hoops
—— Old Broken and Cast Iron
—— Ore
—— Pig
—— Slit or Hammered into Rods

Jalap
Jet
Jewels—Emeralds and all other precious Stones, unset
Jewels, Pearls
Juice of Lemons, Limes, or Oranges

Kingwood

Lac, *viz.* Sticklac
Lapis Calaminaris
Lard
Latten
—— Shaven
Lavender Flowers
Lead Ore
—— Red
—— White
—— Black
—— Chromate of
Leaves of Roses
Leeches
Lignum Vitæ
Litharge
Logwood
Losh Hides

Madder
Madder Root
Mahogany
Manganese, Ore of
Manna
Manures, unenumerated
Metal, Bell Metal
Minerals and Fossils, unenumerated
Models of Cork or Wood
Morphia
Moss, Lichen Islandicus
—— other than Rock or Iceland Moss
—— Rock, for Dyers' use
Mother o'Pearl Shells
Musk
Myrrh

Nicaragua Wood
Nickel, Arseniate of, in Lumps or Powder, being in an unrefined state
—— Metallic and Oxide of, refined
—— Ore of
Nitre—Cubic Nitre
Nuts, *viz.*:
—— Kernels of Walnuts and of Peach Stones, and of Nuts or Kernels thereof unenumerated, commonly used for expressing Oil therefrom
—— Cocoa Nuts
—— Pistachio
Nuts and Kernels, unenumerated

Oakum
Ochre
Oil, Animal
——Castor
——Cocoa Nut
——of Olives, except in Ships of the two Sicilies
——Lard
——Palm
——Paran
——Rock
——unenumerated
——Train, Blubber, Spermaceti Oil, and Head Matter, the produce of Fish or creatures living in the sea, caught by the crews of British Vessels, and imported direct from the Fishery or from any British Possession in a British Vessel
——Seed Oils, *viz.*
——Hempseed
——Linseed
——Rapeseed
——Walnut
——Seed, unenumerated
Oil Seed Cake
Olibanum
Olive Wood
Orange Peel and Lemon Peel
Ore, unenumerated
Orchal
Orpiment
Orris Root

Painters' Colours, unenumerated, unmanufactured
Palmetto Thatch
Pink Root
Pitch
—— Burgundy
Plaster of Paris
Platina and Ore of Platina
Platting or other Manufactures to be used in or proper for making Hats or Bonnets of Chip
Pomegranates, Peel of
Prussiate of Potash

Quicksilver
Quills, Goose
———Swan

Radix Contrayervæ
———Enulæ Campanæ
——— Eringii
———Ipecacuhanæ
Rhadix Rhatanisæ
———Senekæ
———Serpentariæ, or Snake Root
Rags, old Rags, old Ropes, or Junk, or old Fishing-nets, fit only for making Paper or Pasteboard
———Pulp of
——— Woollen
Rape of Grapes
Red Wood, or Guinea Wood
Rhubarb
Rosewood
Rosin

Safflower
Saffron
Sal Ammoniac
—- Limonum
-— Prunella
Salep, or Salop
Saltpetre
Sanguis Draconis
Santa Maria Wood
Sapan Wood
Sarsaparilla
Sassafras
Satin Wood
Saunders' Red
———— White or Yellow
Scammony
Seeds, *viz.* :—
———Croton, commonly used for expressing Oil therefrom
———Hemp
———Poppy
———Sesamum
———unenumerated, commonly used for expressing Oil therefrom
Senna
Shumach
Silk, Raw
—— Knubs or Husks and Waste Silk
—— thrown, not dyed
Skins and Furs, *viz.*
—— Marten, undressed
—— Seal, in the hair, not tanned, tawed, or dressed
—— Squirrel or Calabar, undressed
—— Furs, Pelts, and Tails, *viz.*
—— Badger, undressed
—— Bear, undressed
—— Beaver, undressed
—— Cat, undressed
—— Chincilla, undressed

Skins, Coney, undressed
—— Deer, undressed
—— Dog, in the Hair, not tanned or dressed
—— Dog Fish, undressed
—— Elk, undressed
—— Ermine, undressed
—— Fisher, undressed
—— Fitch, undressed
—— Fox, undressed
—— Fox Tails, undressed
—— Goat, raw
—— Goose, undressed
—— Hare, undressed
—— Husse, undressed
—— Kangaroo, raw and undressed
—— Kid, in the hair, undressed
—— Kolinski, undressed
—— Leopard, undressed
—— Lion, undressed
—— Lynx, undressed
—— Marten tails, undressed
—— Mink, undressed
—— Mole, undressed
—— Musquash, undressed
—— Nutria, undressed
—— Otter, undressed
—— Ounce, undressed
—— Panther, undressed
—— Pelts, undressed, of Goats
—— ———— of all other sorts
—— Racoon, undressed
—— Sable, undressed
—— Sable Tails or Tips, undressed
—— Squirrel or Calabar, Tails of, undressed
—— Swan, undressed
—— Tiger, undressed
—— Weasel, undressed
—— Wolf, undressed
—— Wolverings, undressed
—— Furs, Pelts, and Tails, tanned, tawed, or dressed, *viz.*
—— Deer, — Indian, half dressed, tanned, tawed, or in any way dressed
—— Ermine, dressed
—— Kid, dressed and dyed or coloured
—— Lamb, tanned or tawed
—— Lamb, dyed or coloured
Dressed in Oil :
—— Mink, dressed
—— Pelts of all sorts, tanned, tawed, or in any way dressed
—— Deer, Indian, undressed or shaved
Skins, Goat, tanned, tawed, or in any way dressed
—— Lamb in the Wool
—— Sheep in the Wool
—— —— tanned or tawed, dressed in Oil
—— Squirrel or Calabar, tawed
—— Wolf, tawed
—— Kid, dressed, not dyed or coloured
—— and Furs, or pieces thereof, unenumerated, tawed, curried, or dressed
—— and Furs, or pieces thereof, raw or undressed, unenumerated
Specimens of Minerals, Fossils, or Ores, unenumerated, exceeding fourteen pounds weight each
Speckled Wood
Spelter or Zinc, Rolled but not otherwise manufactured
———— crude, in cakes
Sponge
Squills, dried and not dried
Stavesacre
Staves, not exceeding seventy-two inches in length, nor seven-inches in breadth, nor three-inches and a quarter in thickness
Steel, unwrought
—— Scraps
Straw or Grass for Platting
Sweet Wood
Stone in Blocks, shaped or rough scalped
Sulphur Casts

Talc
Tar
—— Barbadoes
Tarras
Tartaric Acid
Teasles
Teeth, Elephant's
—— Sea-Cow, Sea-Horse, or Sea-Morse
Terra Japonica and Cutch
——Sienna
——Verde
Terra, Umbra
Tin Ore, and Regulus of
Tornsal
Tortoise Shell, or Turtle Shell, unmanufactured

Tulip Wood
Turmeric
Turpentine of Venice, Scio, or Cyprus
Turpentine, unless above the value of 15*s.* per cwt.

Valonia
Vases, antient, not of stone or wood
Vermilion

Ultramarine

Walnut Wood
Water, Mineral
Wax, Bees, in any degree bleached
———— unbleached
—— Myrtle
—— Vegetable
Weld
Whale Fins, of British taking, and imported direct from the Fisheries, or from any British Possession in a British ship
Woad
Wood, for Ship-Building, now admitted at the same duty as Teake Wood
———Birch, hewn, not exceeding three feet long, nor exceeding eight inches square, imported for the sole purpose of making Herring Barrels for the use of the Fisheries
———Teake
Wool, Beaver
—————cut and combed
———Coney
———Hares
———Cotton

Yarn
———Camel or Mohair
———Raw Linen

Zaffre
Zebra Wood

TABLE (*B.*)

Seeds, from and after the 1st June, 1845, *viz.*
———Acorn
———Anniseed
———Beans, Kidney or French
———Burnet
———Colchicum
——— Cole
———Coriander
———Cummin
———Fenugreek
———Forest
———Garden, unenumerated
Seeds, Lentiles
———Lettuce
———Linseed and Flaxseed
———Lupine
———Maw
———Millet
———Parsley
———Quince
———Rape
———Shrub or Tree
———Tares
———Worm

Spermaceti	1 January, 1849.
Sperm Oil of Foreign Fishing	Ditto
Train Oil, or Blubber of Foreign Fishing	1 January, 1847.
Whales' Fins of Foreign taking and not prohibited	1 January, 1847.

A SCHEDULE OF DUTIES OF CUSTOMS.

	£	*s.*	*d.*
Isinglass	0	5	0 per cwt.
Oils, Chemical, Essential, or Perfumed	0	1	0 per lb.
—— Essential, of Cloves	0	3	0 per lb.
Pickles preserved in Vinegar	0	0	4 per gallon.
Pickles or Vegetables preserved in Salt	5	0	0 for every £100 value.
Refined Camphor	0	5	0 per cwt.
Smalts	0	10	0 per cwt.
Turpentine, above the value of 15*s.* per cwt.	0	2	0 per cwt.
Verdigris	0	5	0 per cwt.
Yarn Cable	0	3	0 per cwt.

That from and after the Expiration of Excise Duties on British Glass, and until the 10th day of October, 1846, the following Duties of Customs:

GLASS, *viz.*	£	s.	d.
Any kind of Window Glass, white, or stained of one colour only, not exceeding one-ninth of an inch in thickness, and shades and cylinders, the cwt.	0	14	0
All Glass exceeding one-ninth of an inch in thickness; all silvered or polished Glass of whatever thickness, however small each pane, plate, or sheet, superficial measure, *viz.*			
Not exceeding more than nine square feet, the square foot	0	1	0
Containing more than nine square feet, and not more than fourteen square feet, the square foot	0	2	0
Containing more than fourteen square feet, and not more than thirty-six square feet, the square foot	0	2	6
Containing more than thirty-six square feet, the square foot	0	3	0
Glass, painted, or otherwise ornamented, the superficial foot...	0	3	0
All White Flint Glass Bottles, not cut, engraved, or otherwise ornamented, and Beads, and Bugles of Glass, the lb.	0	0	2
Wine Glasses, Tumblers, and other White Flint Glass Goods, not cut, engraved, or otherwise ornamented, the lb.	0	0	4
All Flint Cut Glass, Flint coloured Glass, and Fancy ornamental Glass, of whatever kind, the lb.	0	0	8
Bottles of Glass covered with wicker (not being Flint or Cut Glass), or of Green or common Glass, the cwt.	0	3	0
Glass Manufactures, not otherwise enumerated or described, and old broken Glass, fit only to be remanufactured, the cwt.	0	14	0

And that from and after the 10th day of October, 1846, until the 5th day of April, 1848, there be charged on the said article one-half of the said duties, and from and after the 5th day of April, 1848, one-fourth of the said duties.

APPENDIX.—PROPOSED ALTERATIONS.

Annatto Flag	Free.		
Bottles, of Earth and Stone	Free.		
Cables—Old, taken from foreign ships, provided the same be rendered unserviceable by reduction into lengths not exceeding three fathoms, for every £100 of the value	10	0	0
Morphia and its Salts	0	5	0
Oil of Olives, imported in ships of the Two Sicilies	Free.		
Poultry, alive or dead, of or from Foreign Countries, for every £100 of the value	5	0	0
——— of and from any British Possessions, for every £100 of the value	2	10	0
Spirits or Strong Waters, of all sorts, *viz.*			
For every gallon of such Spirits or Strong Waters of any strength, not exceeding the strength of proof by Sykes's hydrometer, and so in proportion for any greater strength than the strength of proof, and for any greater or less quantity than a gallon, *viz.*			
——— not being Spirits or Strong Waters, the produce of any British Possessions in America, or of any British Possessions within the limits of the East India Company's Charter, and not being sweetened spirits, or spirits mixed with any article so that the degree of strength thereof cannot be exactly ascertained by such hydrometer, the gallon	1	2	6
Wood, *viz.*			
Maple Wood, and New Zealand Wood, being furniture wood...	Free.		

TO CORRESPONDENTS.

"Inquisitor" and "A Subscriber."—The Portrait of the late President, William Allen, F.R.S., was promised by the engraver in March, but is not yet completed.

"A Well-wisher" is dissatisfied with an observation in our last number, namely, that it would be impossible to prevent altogether the sale of drugs by unqualified persons.—[Our correspondent must be aware that many substances which are in common use as drugs are also used extensively in the arts and manufactures, and are dealt in by drysalters and others, who, although competent to judge of their quality as merchandize, are not qualified Chemists. It would be impossible to frame any law which would confine the sale of all drugs, whether simple or compounded, to licensed Chemists, without interfering with the traffic in a variety of articles of the above description. But it would be very easy as well as proper to prohibit unqualified persons from acting as dispensing Chemists, or assuming any name or title implying that they are qualified Chemists and Druggists. This would be a great protection to our body and to the public, and as much as we could fairly claim under existing circumstances. When we have gained this advantage, experience will show whether any further regulations are requisite or not.]

"Amicus" (Sheffield) is of opinion that it is high time for the Council to think of obtaining legislative interference. The Council have had the subject under consideration for some time past, and have been in communication with the Government and also with several Members of Parliament, who have expressed a disposition to assist with their influence, but the present session being nearly over, it is too late to bring in any fresh Bill. We hope that, before the commencement of next session, the needful preparations will be in a forward state.

W. T. L.—Chemists are not exempted by any Act of Parliament from serving on juries.

"Vindicator" inquires whether a Chemist could legally sell a mixture of spirit of wine, linseed oil, and muriate of antimony. [The Act of Parliament prohibits the sale of "spirit of wine in a pure or unmixed state," or "colourably medicated" as an evasion. We think the above embrocation would not be convertible into a beverage, and that it therefore does not come within the spirit of the Act.]—Milk of roses, see vol. iii., page 116.

R.C.—The questions at the Examinations of the Society are similar to those at the Prize Examinations, but of a more general nature, and embracing familiar practical Pharmacy. A good knowledge of botany is desirable, but a candidate would not be rejected on account of his not being acquainted with all the natural orders.

"Scotius."—We believe that prescriptions are written in Latin in most countries in Europe, but not invariably in France.

"Distillata."—(1.) Aquæ pimentæ may be made according to the Pharmacopœia either from the berries or the oil. The former method produces the best water.—(2.) Aqua cinnamomi should be distilled from the bark, although the Pharmacopœia allows either the bark or the oil to be used. When distilled from the oil it is liable to decomposition, especially if the oil is old; and although the cost is not half so great at first with the oil, it is economy in the end to use that which produces the best result.

W.F.S.—The syrup of iodide of iron should be made as directed in the first volume of this Journal. When the salt is ordered in a prescription with syrup, the syrup of iodide of iron should be used diluted to the strength prescribed.

H.S.J.—(1.) We think the term "potass sulphuris" in the prescription must be intended to denote sulphate of potash, sulphuret of potassium would not be prescribed in such a formula.—(2.) Sulphate of manganese has lately been recommended by Mr. Ure as a mild purgative. The dose is from ℈j. to ʒj.

"Pharmaceutist."—Dandelion Coffee: Clean the root of dandelion and dry it carefully; then powder it, and mix it with ground coffee.

M.S.E.—An earthenware is better than a metallic vessel in the experiments alluded to with grape sugar.

W.H.C.—White wine pickling vinegar is imported from France. The brown vinegar generally used in this country is made from grain.

"Quæsitor"—(1.) *Hoblyn's Dictionary of Medical Terms*, noticed vol. iv., page 241, contains information about patent medicines. *Paris's Pharmacologia* also contains many of the formulæ.—(2.) In using liquor ammoniæ as a test for the purity of balsam of copaiba, the specific gravity should be .920, and it should be used in the proportion of one part of liquor ammoniæ to two parts of the balsam. If the latter be pure, the mixture will not be turbid.

M. P. S. (Sunderland).—*Blaine's Veterinary Art.*

A. B. C.—We have not heard of the application of the electric spark to photogenic purposes.

A. P. S. (Leamington).—It is a curious specimen.

"Chemicus."—(1.) *Pereira's Materia Medica*, 50*s.*; *Thomson's Dispensatory*, 24*s.*; *Christison's Dispensatory*, 18*s.*—(2.) To determine whether the "Spirit of Hartshorn" of the shops is a solution of ammonia or of a carbonate, add an acid, and observe whether there be effervescence.—(3.) Tincture of Pellitory of Spain is a good tincture for tooth-ache.—(4.) *Ipomœa Jalapa*, and *Convolvulus Jalapa*, are different plants, the former is now recognised as the source of commercial jalap. *Dorema Ammoniacum*, and *Heracheum gummiferum*, are different plants; the former is now recognised as the source of ammoniacum.—(5). The dose of creasote is from one to three drops to begin; it is sometimes increased to twenty drops or more.—(6.) We do not publish formulæ for quack medicines.

"A Piccadilly Associate."—(1.) Creta præcipitata is quite as efficacious as creta præparata, and more pure. It forms a whiter mixture.—(2.) Oxymels are usually clarified by boiling, and removing the scum.—(3.) For Emplastrum cerati saponis, see vol. iii., pages 36 and 81.

M. M.—Extractum taraxaci differs much according to the time of year at which it is made, and the mode of making it. It is considered best when made in the autumn, at which time the root yields a milky juice, and the extract made from this will contain an insoluble gummy looking matter.

"Valerius."—For valerianate of zinc, see vol. iv., page 131. It is sold by the wholesale druggists.

J. W. N.—(1.) Nitrous oxide gas should be kept in glass vessels.—(2.) The presence of red lead in the red oxide of mercury may be detected by heating a portion of the oxide to redness, when the mercury will be volatilized, and the oxide of lead, if present, will remain.—(3.) Corrosive sublimate is sometimes added to ink to preserve it from becoming mouldy.—(4.) For the composition of bronze, see vol. iv., page 338.

"Ægrotum Studiosus."—(1.) "Apply the cupping instrument beneath the posterior and inferior part of the shoulder-blade near the part where the ægophony is heard, and draw twenty ounces of blood as quickly as possible." *Ægophony*, from *αιγος*, gen. of *αιξ a goat*, and *φωνη*, a modification of vocal resonance, which has been compared to the bleating of a goat. *Quo* and *eo*, added to the comparatives, are called intensive particles. The latter part of the sentence is literally translatable thus: "The sooner you should have drawn it, the better."—(2.) Cutch is obtained from *Acacia Catechu*; terra japonica, from *Uncaria Gambir*. The term catechu is sometimes applied to the two preceding extracts, as well as that obtained from the *Areca Catechu*, but it is more distinctively applied to the last only.—(3.) The atomic constitution of the iodo-cyanide of potassium and mercury is not satisfactorily determined.—(4.) Guaiacum resin is rendered blue by the action of nitrous acid gas.—(5.) Oxamide or oxalamide is one of the products of the decomposition of oxalate of ammonia by heat.

Erratum.—In our last number, page 37, line 3, *for* peroxide of iron, *read* percyanuret.

Advertisements to Mr. Churchill, Princes Street, Soho.

Other Communications to The Editor, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. III.—SEPTEMBER 1st, 1845.

SIR JAMES GRAHAM'S BILL FOR THE REGULATION OF PHYSIC AND SURGERY.

FOURTH EDITION.

THE hope which we entertained a few months ago, that the Medical Reform Question would shortly be amicably settled, has now vanished, and we see before us the prospect of much difficulty and embarrassment during the approaching session of Parliament.

The Bill in its present form is in some respects more objectionable than any of its predecessors, and it will be the duty of our body respectfully to solicit the introduction of several very material alterations, and in the event of this being refused, to offer to the Bill the most determined and vigorous opposition.

In the first place, the exceptive clause in favour of Chemists and Druggists* is omitted. We can scarcely suppose that this omission is to be attributed to the negligence of the printer's devil, although the supposition is favoured by the existence of several other errors, verbal and typographical, in the printing of the Bill. But whether the omission be intentional or not, it is an evidence of the absolute necessity of vigilance and activity on our part, for if such a bill were to be passed, and we were to find ourselves subjected to daily annoyance and persecution in consequence, it would be no consolation to be told that it was quite an accident.

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* See page 13 of this volume. As the Bill now stands, any person in England, whether a Chemist or not, who should act as an Apothecary, without being registered as a Member of the New College of General Practitioners, would be liable to be punished by fine or imprisonment, or both. In Scotland and Ireland not only Chemists, but quacks of every description, might usurp the whole business of the Apothecary, without any restraint or restriction whatever!!

We mentioned briefly in our last number our objection to the establishment of the New College of General Practitioners. With the modifications now proposed, this objection is increased, and we need only point out what would be the nature and functions of that College to convince our brethren that it would seriously affect the interests of our body, and frustrate the exertions which we are making to elevate Pharmacy to its proper rank as a distinct branch of the profession.

The New College was originally proposed as a rival power to the Colleges of Physicians and Surgeons. It made no pretensions with reference to Pharmacy, and the whole energy of its promoters was directed to the establishment of a degree in Medicine, Surgery, and Midwifery, which should give the possessor a standing equal to that conferred by the other Colleges. Although Pharmacy was not renounced by the proposed College, it was kept so much in the background, that the Chemists could not, without appearing hypercritical, bring forward any tangible objection to the proposal. We therefore, in that stage of the proceedings, left the three medical bodies to maintain their respective rights and privileges, feeling persuaded that the Colleges of Physicians and Surgeons would not allow such a measure to be carried without a very severe struggle.

The result of that struggle has been that the proposed New College has been shorn of its chief power and dignity. Medicine and Surgery are cut off, Midwifery is struck out, and nothing remains but a new Society of Apothecaries, an institution which can confer no degrees in what are termed the higher branches of practice, but whose powers are limited to the granting of licences to practise Pharmacy and attend patients. The licentiates are to have the power of recovering charges for drugs like other tradesmen, and the standing they are to enjoy is such, that they will have no inducement to waive this privilege from notions of professional dignity.

It is easy to foresee that if such an institution as this were to be created, the practice of Pharmacy would be a leading feature, and being the only Pharmaceutical Establishment recognised by Act of Parliament in this country, it would naturally strive to obtain control over that department altogether.

This, we have no hesitation in saying, would be the result of establishing a New College in the manner now proposed. At the same time, we doubt very much whether the General Practitioners themselves will be contented to accept the degrading position thus offered them. We believe the opinion is gaining ground that the medical profession would be raised in character and respectability by becoming disconnected with the trading functions hitherto blended with it, and in effecting this separation, the only point on which medical men are likely to be at all tenacious, has reference to the question of remuneration. A plan by which medical practitioners would be adequately remunerated for their professional skill, without condescending to act as tradesmen, would, we believe, give more general satisfaction than a continuance of a system, the objections to which have been so frequently pointed out.

We have already on several occasions alluded to the plan which we consider best calculated to effect this object, the foundation of which plan consists in the recognition by law of a distinct Pharmaceutical Establishment. This body being regulated by a representative Council, under the superior control of the Council of Health, should be empowered to carry out a proper system of education and examination.

For the protection of the public, and in justice to qualified Pharmaceutists, a clause should be introduced into the Bill to the following effect:—

> "And be it enacted, That every unregistered person who shall wilfully and falsely pretend to be, or take or use the name or title of Chemist and Druggist, Pharmaceutical Chemist, or any other name, title, addition, or emblem, implying that he is registered under this Act, or recognised by law as a dispenser of medicines, and also every registered person who shall take or use any name or title belonging to any class in the registry to which he does not belong, shall be deemed guilty of a misdemeanour in England and Ireland, and in Scotland of a crime and offence, and being convicted thereof, shall be punished, &c. &c."

The nature of the punishment and the mode of conviction should be the same as the law provides, or will provide, for the restraint of unqualified Medical Practitioners.

Medical Practitioners should have the power of recovering fees for attendance, but not for medicine administered. Chemists should be empowered as they now are, to recover charges for medicine, and prohibited from visiting patients. The question of counter practice is the only difficulty, and this would be most effectually met by making those who transgress beyond the bounds of propriety responsible for the result, and liable to summary punishment in case of manslaughter. The improvement in the education of Chemists would tend greatly to diminish the propensity to encroach on medical practice, since it may be stated as a general rule, that those who are the least informed are the most venturesome.

The arrangement which we propose, would also remove the chief source of abuse in this respect, by putting an end to the jealousy between Chemists and General Practitioners.

In case it should be argued that this plan might answer in the metropolis or other large cities, but would be inapplicable to the case of small country towns, we need only observe that a country practitioner might, if necessary, meet the demands of the public in his district, by obtaining a qualification in Pharmacy as well as in general practice. Thus, while the law recognised the two departments as distinct, the practice of individuals would be regulated by the public necessities in their respective districts, and the adoption of the plan in localities to which it might be applicable, should be encouraged by conferring a certain professional rank on those who renounce the trade.

MR. WAKLEY'S PROPOSED MEDICAL BILL.

HOUSE OF COMMONS.

Friday, August 8th.—The fourth Medical Bill of the Government having been delivered to Members on Thursday—

Mr. Wakley gave notice, this evening, that early in the next session of Parliament he should move for leave to bring in a Bill to amend and consolidate the laws for regulating the profession of Physic and Surgery, and the practice of Pharmacy, in Great Britain and Ireland, with a view to obtain—

I.—The Registration of "every person who, at the time of the passing of the Act, shall be legally practising, or entitled to practise, as a Physician, a Surgeon, or an Apothecary, in some part of her Majesty's dominions."

II.—An equality of rights and privileges for registered Medical Practitioners throughout the kingdom.

III.—Representative systems of government in the Colleges of Physicians and Surgeons.

IV.—The election, by those Colleges, of a National Medical Council, having for its President a Principal Secretary of State.

V.—The introduction of comprehensive systems of Education in the Schools of Medicine and Pharmacy.

VI.—The appointment of Courts of Examiners by the Colleges of Physicians and Surgeons of England, Ireland, and Scotland.

VII.—The admission of the Examiners into the hospitals and other public institutions, for the purpose of enabling them to test the knowledge of the Candidates for diplomas in Medicine and Surgery, at the bedsides of the sick.

VIII.—The repeal of those sections of the Charter that was granted to the College of Surgeons of England in 1843, which displaced the Members of that College from the professional rank they had previously enjoyed.

IX.—The right of every registered Practitioner in Medicine and Surgery to recover reasonable charges for Medical and Surgical advice and attendance, without other licence than the registry.

X.—The examination and registration of Chemists and Druggists, in England and Scotland, by the Royal Pharmaceutical Society of Great Britain; and, in Ireland, by the Society of Apothecaries of Dublin.

XI.—The more effectual protection of the public against the dangerous proceedings of unqualified Medical Practitioners and unlicensed Chemists and Druggists, by making the offences of such persons questions for the summary jurisdiction of magistrates.

XII.—The prohibition of the sale by retail of certain poisons, except by licensed Chemists and Druggists.

XIII.—The separation of the practice of Physic and Surgery from the sale of Drugs and Medicines.

If we may judge of the Bill itself from the above programme, we have no hesitation in pronouncing it to be one of the best schemes that has been proposed for the consideration of Parliament. We presume that the second clause, in alluding to an equality of rights and privileges for registered Medical Practitioners, is not intended to convey an idea that the *rank* of all is to be equal; if so, it would entail on the Bill the opposition of the Colleges of Physicians and Surgeons, which bodies will naturally lay claim to a higher rank than that of the General Practitioners. But we forbear to enlarge upon this subject, and other parts of the proposed measure, which do not immediately concern our body. The tenth clause is quite in accordance with our views, and the eleventh in its present form is unobjectionable, since the Bill proposes to provide for licensing all qualified Chemists and Druggists, and the summary proceedings before magistrates apply only to those who are unlicensed, or, in other words, to persons who have assumed a name to which they have no legal right.

Our readers are aware that Mr. Wakley has always been an advocate for the restraint of Chemists and Druggists, as well as all other persons not recognised as Medical Practitioners. The impossibility of effecting this object to the extent which has been attempted, has, on several occasions, been pointed out in this Journal, and we believe it is now generally admitted that a qualified Chemist and Druggist is expected to be acquainted with the nature, doses, and properties of medicines, and cannot be prohibited from answering any questions which may be asked by his customers in his shop on such subjects. We need not, however, be surprised at any verbal alterations, or restrictive clauses, which might be introduced in committee, or even during the preliminary deliberations on the subject. It will therefore be absolutely necessary carefully to watch the progress of the Bill in the event of its introduction before parliament, although the programme appears to be quite favourable and entitled to our support. The separation of the sale of medicine from the practice of physic and surgery would be very beneficial to our body, and also to the public, as we have already had occasion to point out.

The PHARMACEUTICAL SOCIETY was established for the express purpose of advancing Pharmacy, and securing the independence of our body. The progress which we have made in a few years should stimulate us to renewed exertions. We are now recognised as a body politic, and our right to take the management of our own affairs is no longer disputed. It will be our own fault, if a proposal should again be brought forward for placing us under the jurisdiction of the Apothecaries, with whom we ought to be on the most friendly terms, although entirely disconnected. All branches of the profession are interested in the promotion of proper regulations with reference to Pharmacy, and naturally look to the PHARMACEUTICAL SOCIETY to fulfil the expectations and intentions with which it was originally established.

We have before us an opportunity, which, if neglected, may not occur again. If we fail to take advantage of it, we shall deserve to suffer any persecution that may hereafter be inflicted upon us, and to be punished "by fine or imprisonment, or both, as the Court before which we may be convicted shall award."

THE PROGRESS OF PHARMACEUTICAL SCIENCE.

UP to the present time, it can scarcely be said that Pharmacy has been studied as a science in this country; for although it has claimed the individual attention of many Members of our body, as well as medical men, it has not been recognized by law as a distinct scientific avocation, and while it has constituted a subordinate and incidental part of the education of the Apothecaries, the Chemists, with whom it is the primary pursuit, have not as a body studied it systematically.

In fact, we have not unfrequently heard it stated, that a "Scientific Chemist" could scarcely be a "Bread and Cheese Chemist;" in other words, that the propensity to dive into the science of the Laboratory was calculated to divert the mind from business, and interfere with the success of the shop. In the education of an apprentice, we have noticed how much importance has been attached to the art of cleaning windows, dusting counters, folding up a neat parcel, serving customers with civility and despatch, and such other duties as appertain to the trade of the Druggist; while the science of the Chemist has been either purposely or habitually kept rather in the background, as if it were considered that the youth would pick up instinctively as much as was requisite or desirable for the purposes of business, by means of the daily manipulations, without any specific study or mental cultivation. A Pharmacopœia and an elementary work or two on Chemistry and Materia Medica being provided, the student had the opportunity of improvement, the extent of which would depend on his own sagacity and perseverance. This is the system of education which, up to within a few years of the present time, was prevalent, and although we might occasionally hear lectures spoken of as an advantage to apprentices, the enjoyment of this privilege was a rare exception to the general rule. No education being necessary to enable a man to commence business as a dispensing Chemist, the only stimulus to mental cultivation was the ambition to excel others, and this was in some degree checked by the notion above alluded to, that too much science was incompatible with successful trade.

During the last few years, so great an advancement has taken place in science generally, that not only Chemists, but all persons with any pretensions to education are expected to be, more or less, acquainted with the principles which regulate the laws of nature and the chemical constitution of ordinary bodies. The Royal Institution, which was established for the cultivation of Chemistry and its application to the Arts and Manufactures, has tended greatly to promote the popularity of this inexhaustible and instructive science; and recent discoveries have invested it with a new and much more important character than it previously enjoyed.

Under these circumstances, it was not likely that the Chemists would continue plodding on in the mechanical routine of their business, without making some effort, either individually or collectively, to keep pace with the times; and the value of scientific attainments to the Pharmaceutical Chemist was increasingly felt. The practice of attending lectures became more prevalent, and some of the Members of our body visited Paris or Giessen, for the purpose of availing themselves of those opportunities of improvement which their own country did not afford.

The interference of Mr. Hawes and other medical reformers with the independence and privileges of Chemists and Druggists on the ground of their alleged incompetence and want of education, roused them to a sense of their real position, and the result has been the establishment of the PHARMACEUTICAL SOCIETY, a prominent object of which is the advancement of the art and science of Pharmacy.

The institution of courses of Lectures expressly for the education of Chemists and Druggists, is a new feature in this country; and when we consider the difficulty of changing the habitual arrangements of houses of business, so as to admit of the young men attending lectures, the success of the experiment is quite as great as could have been expected. The general adoption of this means of education cannot be suddenly effected, but will be a work of time. The opinion is becoming increasingly prevalent that the attendance on a few courses of Lectures, during the intervals which can be spared from business, is not sufficient to produce a high and creditable degree of proficiency in the Pharmaceutical Chemist, and that every student ought at the close of his apprenticeship or pupilage, to devote a certain period of time exclusively to mental cultivation and practical study.

The PRACTICAL INSTRUCTION IN THE LABORATORY OF THE PHARMACEUTICAL SOCIETY has been instituted for the purpose of enabling young men to become fully acquainted with the theory and practice of Pharmacy; and the progress which has been made by the pupils during the first year of the undertaking has demonstrated the benefit to be expected from its continuance on a more extended scale. We hope this will become in course of time a regular part of the education of the Chemist, and that parents, when placing their sons in a house of business, will insist upon the privilege of a season being allowed for this very important study. The Apothecary or General Practitioner is obliged to devote the last two or three years of his apprenticeship to lectures, dissections, and hospital practice, and could not be admitted to examination without producing certificates of such attendance. The education of the Chemist ought to be as elaborate in degree as that of the Medical Practitioner, and it is quite as necessary for him to study in the Laboratory as it is for the medical student to walk the Hospital. There is as much science required in one department as in the other, although the nature of the studies varies with the occupation, and since the medical student is obliged to give up two or three years to the scientific study of his profession, the student in Pharmacy has no reason to complain if required to devote a year to a similar object. A parent who could afford to give an apprentice fee with his son could equally afford to pay the small additional expenses of instruction in a school of Pharmacy. Those who could not defray the necessary charges attendant on a proper education, should bring up their sons to some other business more consistent with their means. We expresed these sentiments at the time when the PHARMACEUTICAL SOCIETY was first projected, and we repeat them in detail, in the conviction that unless the Chemists make an effort at the present crisis to sustain and improve their character as a scientific and pharmaceutical body, they will lose the opportunity of securing to themselves their proper position and accustomed privileges.

The value of practical instruction in Chemistry is now so generally appreciated, that several institutions are about to be brought into active operation for this especial purpose. The discoveries recently emanating from the Giessen laboratory, and the progress which has been made by many continental Chemists, more especially in the abstruse department of Organic Chemistry, have extended far and wide the public curiosity and desire for enlightment on the subject, and we are glad to find that an establishment similar to that of Professor Liebig at Giessen is about to be opened at University College, under the superintendence of Professors Graham and Fownes. The object of this school is to give practical instruction to pupils in the highest branches of Chemistry, including ultimate analysis and the most abstruse researches in reference to the constitution of organic bodies.

We have heard that similar arrangements are in progress at King's College, but have not yet seen a Prospectus.

Another institution, namely, the College of Chemistry, has been announced as about to commence operations in Hanover Square; and we are informed that Professor Hoffman, a German Chemist, has been appointed superintendent. We regret that it has been considered necessary to send out of the country for a Chemist to carry on this undertaking; for while we are naturally desirous to see our own country keeping pace with others in scientific reputation, we cannot but feel that our national credit is diminished by the appointment of a foreign professor.

A fourth establishment of this kind is, we have been informed, in contemplation, under the superintendence of Dr. Playfair.

If all the practical schools above enumerated should come into immediate and active operation, very extensive accommodation will exist in this metropolis for the prosecution of chemical researches and education; and provided the supply of Pupils should be in proportion, we may expect shortly to become a nation of scientific Chemists. A certain amount of competition is highly desirable, and the only fear we entertain on the subject is, that the sudden inundation of the country with practical schools, may in some measure defeat its own object, by providing more accommodation than the public demand will support. We sincerely hope this fear will prove to be groundless.

BOTANICAL GARDENS.

The ancient Apothecaries were fully sensible of the value of Botanical Gardens to the student, and before they were recognised by law as a body, some of the most active of their number had projected an establishment of this description, where a variety of plants might be cultivated and properly arranged. The earliest Botanical garden on record was situated in Holborn, and belonged to John Gerarde, at the end of the sixteenth century. About 1630, Tradescant established a similar garden in South Lambeth; and a few years afterwards the Society of Apothecaries commenced their "Physic Garden" at Chelsea, which was let on lease, dated August 29, 1673, by Charles Cheyne, Esq. (afterwards Lord Cheyne), to the Society, at a yearly rent of £5 for the term of 61 years. Several of the members built a wall round the garden chiefly at their own expense, it being made a condition that the Court of Assistants should pay £2 every year for ever to each of the six herborizings. The proprietors of the laboratory stock gave £50 towards the expense of the wall on condition of being allowed a piece of the garden for herbs. There was also a physic-garden at Westminster, the lease of which was purchased by the Society of Apothecaries for the sake of the plants, which were removed to Chelsea. The expense of the Chelsea garden about this time is stated to have been £180, including the gardener's salary, which was £50.

In 1707, the expense of the garden was found so heavy that it was proposed to part with it, but the zeal of the members prevailed, and a subscription was raised, twenty of them agreeing to contribute £100 per annum among them for seven years. A general subscription of 2*s.* a year from the members, and also fees from apprentices, aided the funds.

In the year 1714 Sir Hans Sloane was brought into communication with the Society, the freehold of the garden having become his property; and in 1722 a new lease was granted to the Society of Apothecaries on the following conditions. The lease declares that the garden "is hereafter to be continued as a physic-garden, and for the better encouraging and enabling the said Society to support the charge thereof, for the manifestation of the power, wisdom, and glory of God in the works of the creation, and that their apprentices and others may better distinguish good and useful plants from those that bear resemblance to them, and yet are hurtful, and other the like good purposes," Sir Hans Sloane confirms the former lease, the garden being held for ever at the yearly rent of £5, the Society rendering yearly to the Royal Society fifty specimens of distinct and different plants, well dried and preserved, which grew in the garden the same year, with their names, until 2000 shall have been received. In the event of these conditions not being fulfilled, and the garden being converted into building ground for dwellings or any other purpose, save such as are necessary for a physic-garden, the lease should be forfeited and transferred to the Royal Society on the same conditions, and if refused it should be transferred in trust to the College of Physicians.

In 1732 a subscription of £549 14*s*. was raised for building a greenhouse, the corporation agreeing to contribute a sum not exceeding £500 for this purpose. In the course of two years a greenhouse, and two hothouses were erected, the total expense of which is stated to have been £1891 16*s*. In 1733 the Court of Assistants made an order that £20 a year should be paid by the Society towards the expense of sending a person to Georgia to collect plants and trees.

On several occasions Sir Hans Sloane contributed considerable sums of money towards the repairs of the greenhouse and other expenses of the garden, which in 1753 had increased to £328. In 1772 a demonstrator of Botany was appointed by the Society to superintend the garden, to encourage the cultivation of Botany among the students, to attend at stated times to demonstrate the plants, to make an annual excursion for two days at least to collect plants, to accompany the students in their herborizings, and to prepare plants for the herbarium, &c.

Sir Joseph Banks and many other distinguished men presented exotics and seeds, and subscriptions were frequently raised for various purposes, from which it appears that, notwithstanding the low rent, the garden was with difficulty maintained. In 1817 the ordinary expenditure had amounted to £535 8*s*. 11*d*., exclusive of repairs.

During a recent investigation before a Committee of the House of Commons, in reference to some projected improvements in the metropolis and its vicinity, the propriety of removing the Chelsea garden was considered, and the opinions of several scientific men were taken on the subject. It appeared to be the general opinion that the garden was not in so flourishing a state as could be desired, and that it had deteriorated considerably of late years. This was attributed partly to the want of sufficient funds to keep it in an effective state, and partly to the increase of buildings, manufactories, and chemical works in the neighbourhood, which vitiated the atmosphere.

Dr. Pereira, on being asked his opinion as to the propriety of removing the garden to Kew, admitted that the situation of the latter place was greatly preferable for the cultivation of plants, but considered that the distance from town would be a serious inconvenience to medical students, and would, in many cases, prevent their deriving any benefit from it. The plan of sending specimens to London for the lecture-room was discussed, but this was admitted to be insufficient to give the students an accurate and complete knowledge of them, unless they could occasionally see the plants growing. Dr. Pereira adverted to the Botanical Garden in the Regent's Park, as being more within reach of students, although he admitted that the soil and locality were not the most favourable for the purpose; but he considered the garden a very useful one for medical students, and mentioned the satisfaction which had been given to the botanical students of the PHARMACEUTICAL SOCIETY, by the lectures delivered in that garden by Dr. A. T. Thomson. Dr. Iliff and Sir William Hooker considered the situation of Chelsea Garden incompatible with the successful cultivation of plants for botanical purposes, and advocated the establishment of a similar garden at Kew.

We quite agree with Dr. Pereira in the opinion that the distance of Kew from London is a serious objection, and can bear testimony to the benefit which the students of the PHARMACEUTICAL SOCIETY have derived from attendance at the Gardens with Professor Thomson; but since the soil and situation of Kew are favourable to plants, and the undertaking is to emanate from the government, we think it desirable by all means to promote its accomplishment. This, however, should not interfere with the establishment or maintenance of a garden in a more accessible situation if a suitable site could be found. Although the latter would be inferior in character and extent, it might be sufficiently complete to be extremely valuable for the delivery of demonstrations or lectures.

A garden is to the botanical student as important as the laboratory to the Chemist; and since it is impossible to have so flourishing and extensive an establishment in or near the metropolis as a few miles in the country, there can be no objection to the existence of two gardens at least: the one on a small scale and accessible to students would be available for regular and elementary instruction; the other being situated at a greater distance might be visited occasionally, and ought to be conducted on such a scale as to be a national establishment, comprising every plant which can be cultivated in this country.

As the Metropolitan Botanical Lecturers experience some inconvenience and difficulty in procuring a sufficient supply for their Lectures, of recent illustrations, especially of medical plants, it should be one of the objects of a public Medico-Botanical Garden to provide lecturers under certain regulations, with such specimens as they may require, either gratuitously or on very moderate terms.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

NAMES OF CANDIDATES WHO HAVE PASSED THE MAJOR EXAMINATION.

John Sparks	237, Tottenham Court Road
Edward Pinder . .	High Street, Camden Town
Geo. Frederick Schacht	17, Bloomsbury Square
Josh. B. French . .	Ditto
John R. Hall . . .	Ditto
John R. Rogers . .	Ditto
George F. Smyth . .	Ditto
Thos. Bonner Teasdale	338, Oxford Street

ASSOCIATES ADMITTED ON PASSING THE MINOR EXAMINATION.

Robert Heming . .	Margate
Ebenezer Pearse . .	Sherborne
John Nutter . . .	Preston
Richard Taylor . .	
John Langford . .	
John Hall	Mitchell Dean
H. E. Suggate . . .	Bath Street, St Luke's
R. A. Bristowe . . .	177, Regent Street
Paul T. Gibbs . . .	Dudley Grove, Paddington
William Wilkinson .	Gainsborough
William Johnson . .	86, New Bond Street
George Boulter . .	29, Haymarket
Edwin Galt	Portsmouth
Richard Thompson .	3, Broad Street, Bloomsbury
Joseph Redford . .	Windsor
Henry Wakefield .	23, Great George St., Euston Sq.
William Johnson . .	35, Blackman Street, Southwark
Henry Humphreys .	2, Queen's Row, Pimlico
William Boston Proctor	27, Cole's Terrace, Islington
Geo. Wm. Shrubsole .	60, George Street, Portman Square
Alfred Wyatt . . .	51, Park Street, Grosvenor Square
John T. M'Owan . .	10, St. George's Place, Liverpool Rd.
Henry Thos. Lamplough	4, William Street, Knightsbridge
Thomas B. Teasdale .	338, Oxford Street

ORIGINAL AND EXTRACTED ARTICLES.

PROCESS FOR PREPARING VALERIANIC ACID.

MESSRS. T. AND H. SMITH.

Having of late had considerable demand for valerianate of zinc, in consequence probably of a desire among medical men to test its value as a therapeutic agent, we were led to inquire whether a method of obtaining the acid of valerian more quickly and abundantly than by the usual process, so very unsatisfactory in these respects, could not be devised. The method we adopted completely answered our expectations, and as it may be of some use as a guide to other Chemists, who may have occasion to prepare valerianic acid, the process is subjoined.

Let the valerian be boiled for three or four hours in rather more than its bulk of water, holding in solution an ounce of carbonate of soda for every pound of the root, and replacing the water as it evaporates. Let the liquid be strongly pressed out, and the residuum again boiled for a little, with a like quantity of water. After another pressing, let the process be repeated in the same way, a third and last time. After mixing the liquids, and adding two fluid drachms of strong sulphuric acid for each pound of the root used, let them be distilled. When about three-fourths of the liquid have passed into the receiver, let the distillate be fully neutralized with carbonate of soda, for which purpose a quarter of an ounce for every pound of the root will be quite enough. The valerianic acid can then be obtained in the usual way; viz., by concentrating the solution of valerianate of soda, decomposing it with sulphuric acid, and separating the valerianic acid, now set free, either by means of a separator or distillation. When the valerianic acid has been once obtained, no difficulty can occur in preparing any of the valerianates.

The advantage of this method over that in which the root itself is simply distilled with water, will be seen on contrasting the results of both. By the latter method, the time required was six times greater than when the valerianate of soda in solution was distilled after adding a strong acid; and although the sacrifice of time was so much greater in the first case, the contents of the still continued to smell strongly of valerian, while in the latter, not a trace of the peculiar odour of valerianic acid could be detected, showing that the principle had been more effectually exhausted. And further, the amount of acid obtained, four scruples from the pound of root, was nearly thrice as great as could be got without the use of soda.

Since the above process was adopted by us, M. S. Rabourdin, *Pharmacien à Orléans*, has published in the *Journal de Pharmacie*, a method suggested apparently by views of the subject similar to our own. He conceived that the valerianic acid might be partly in combination with a base, and that by adding a strong acid the volatile acid would be completely set free, so that on distillation a much larger product would be obtained. The result wholly justified his preconceptions. Five kilogrammes of the root gave from forty-five to fifty grammes of the acid, a result closely agreeing with the quantity produced by our own process.

The principle of the process suggested is very simple. In the one case an acid is presented to a valerianate, or supposed valerianate, to free it from combination with its base, by the exertion of a stronger affinity; while in the other case a base (soda) is presented to the valerianic acid, powerful enough to cause its effectual separation from that with which it was previously combined.

The two processes serve the same end, but it seems to us, that the latter is on the whole to be preferred, principally because it has the advantage of presenting the acid in a state of complete solution, from which the operator can get it more easily and effectually detached, than when contained in the hard unyielding cells of the woody fibre.

21, *Duke Street, Edinburgh.*

EASY METHOD FOR ASCERTAINING THE PURITY OF ANY SAMPLE OF SULPHATE QUININE, OR ITS DEGREE OF ADULTERATION.

BY JOHN T. BARRY.

Weigh up *exactly* twelve grains of sulphate (disulphate) quinine, of known purity, and put it into one half-pint bottle, marked "standard." Into another, marked "sample," put precisely the same quantity of the article to be tried. To each bottle add, by weight, just 3500 grains (half-a-pound av.) of distilled water, and lightly cork. Let both macerate in a water-bath some minutes till dissolved, and then remove them to a shelf. At the end of twenty-four hours, having cooled to about 55°, the standard solution will have deposited a few feathered crystals. If the "sample" solution be found to have formed a similar quantity of crystals, its purity is placed beyond question.

This result depends upon the fact that sulphate quinine requires, at ordinary temperatures, rather more than 300 waters to retain it in solution.

But suppose the "sample" solution above directed does not form any crystals, and you wish to find *the degree* of adulteration, proceed as follows:—

Add to it exactly one grain *more* of the quinine salt, and replace both bottles in the bath till the whole is redissolved. If upon now cooling as before, an *equal quantity* of feathered crystals appear in both, you may infer that the adulteration amounts to *one-thirteenth.* If, however, in order to procure an equal deposit of the crystals from both, it be necessary (proceeding as before) to add another grain of the sample, then the conclusion to be drawn is that the adulteration amounts to *two-fourteenths*, whatever may have been the adulterating ingredient —whether salicine, sulphate of cinchonine, or any other.

If in obtaining the reproduction of crystals, you find it needful to employ a *third* additional grain, then the inference is, that adulteration exists to the extent of *three-fifteenths*; and so on for any other added portion. Where time presses, several experiments may be made at the outset, using respectively 12, 13, 14, or more grains of the suspected sample. The only necessary precaution is to see that the balance is delicate and the weights accurate. When there is no sulphate quinine of standard purity at hand for making the trial, the commercial article may be recrystallized for that purpose, by dissolving 24 grains in fl℥iv. of boiling distilled water, and filtering while hot. The new salt should be dried without heat, by pressure, between renewed folds of blotting paper, and subsequent exposure to the air.

TEST FOR ADULTERATIONS IN DISULPHATE OF QUININE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—It has been mentioned to me, that in the test proposed last month for the presence of organic adulteration in disulphate of quinine, I omitted to notice an important fallacy, viz., that if diluted sulphuric acid is evaporated, *nearly or quite to dryness* with *pure* disulphate, a black frothy compound is formed. This is certainly true, and ought to be guarded against. In applying the test, a *black* colour will be produced almost as soon as the solution begins to boil, if sugar or gum is present; but if the disulphate is pure, no effect, or at the most a *slight brown* tinge will appear, until the solution is so concentrated that *white fumes* of sulphuric acid are volatilized. The application of heat should be stopped on the first appearance of these fumes, or if continued, it will occasion the decomposition and charring of the quinine itself. If organic adulteration is present, a deep *black* stain will be observed long before the concentration has been carried to this point; and if merely a slight brown tint is present, the sample may be considered pure. One or two trials with pure quinine, and with the same sample purposely mixed with different proportions of sugar, will illustrate the above directions better than any description however long.

Believe me, dear Sir,
Yours very truly,
J. Birkbeck Nevins.

76, Falkner Street, Liverpool.
Aug. 14*th*, 1845.

ON THE PROPERTIES ASCRIBED TO SOME SPECIES OF COMOCLADIA.

BY WILLIAM HAMILTON, M.B.

In the *Gardeners' Magazine*, for May, 1842, page 286, an extract is given from the correspondence of Mr. Edward Otto, during his voyage to Cuba, and his residence there, which, as it contains statements of a singular character, appearing to call for further investigation, may, perhaps, without impropriety, be transferred to the pages of the *Pharmaceutical Journal;* and followed up by a few observations in the hope of eliciting further information. Writing from Trinidad de Cuba, Mr. Otto says,

"The only thing I found here was dearly bought. The guao is a tree from four to eight feet in height, with beautiful dark green leaves, having a brownish tinge round the margin. The blossoms are small, of a bluish brown, and hang like loose bunches of grapes at the points of the shoots, or even on the stem itself, as it has seldom branches. This tree is frequently found near small rivers, particularly in barren and stony places, and in the Savannahs, some eight feet in height; it may be seen in the immediate vicinity of Trinidad, and *no one ventures to cut it down as its bad properties are so well known.* In the Savannah, near the city, I saw, on the 12th of March, a specimen of this tree four feet in height, in full flower. Quite delighted with the sight, I cut off the top and also some shoots from another specimen, and laid them with the other plants which my negro carried. A dark brownish green sap flowed from the wounds and stained my hands. On returning home I arranged the collected blossoms, and found I could not remove the stains on my hands by means of soap and a brush; and when I made the natives understand my grievance, they told me *I might be glad to come off with my life,* because, although some were only injured by touching the sap, others again by *merely coming in contact with the tree, or by passing near it,* have experienced fatal effects. About noon, on the day I touched the sap, I experienced a painful burning on my face and arms, and particularly about my eyes, and it became greater towards evening. My sleep was tolerably placid, but what was my horror on awakening to see my face most dreadfully swollen, my eyes projecting far out of their sockets, and I could only see a faint glimmer of light with the left. A tormenting itching and burning came over my whole body, and I found it was quite time to send for medical aid. Bleeding, washing with water from a decoction of the blossoms of the malva, a bath, and twelve leeches on my eyes, were the expedients the doctor resorted to; the swelling abated towards evening, and the following day I was able to see. The swelling was quite gone in the course of five days, and it was followed by the breaking out of a red colour all over the body, resembling that in the scarlet fever. I then had a bath in which there was put a proportion of brandy; and as there are no wells in the town, the water was obliged to be fetched from a brook about a mile off. When the redness and burning disappeared I might have been taken for a native, as I could hardly be distinguished from a mulatto. Experience is indeed of much value, but this one was outweighed by extreme pain, several days of idleness, and great loss of money. The medical man who attended me charged $8 for eight visits, bleeding $½, medicine $5, and the twelve leeches $7 4 reals (about eleven Prussian rix-dollars). The blossoms and twigs of the guao, which I sent among other dried plants without a botanical name, are certainly of some value, and I recommend great prudence in their examination. I was told that this plant is used officinally in cholera and yellow fever; but in this respect I did not wish to renew my acquaintance with it."

Such is the singular narrative of Mr. Otto.

What then is the plant which, in the fearful energy of its inflammatory powers, appears to rival the celebrated strychnos tieute (*Tietteck* or *upas tieute*), a climbing shrub of Java, conjectured to be the fatal upas of which the Dutch surgeon gave to the world so marvellous an account; and to exceed infinitely that of the strychnos toxifera (*Woorally*, *urari*, or poison plant of Guayana), also a climber, employed by the American Indians in the preparation of the poison with which they medicate their arrows? Whatever it is, Mr. Otto's narrative is highly valuable, as giving the pride of science a practical lesson on the folly, if not danger, of treating popular opinions with contempt or neglect. It appears probable, although the fact is not stated in so many words, that, during the operation of cutting the specimen, some of the sap got upon his face and even into his eyes, or that he incautiously applied his hands, smeared as it seems with the sap, to his face, where the skin is thinner and the power of the absorbents greater. The effects of the milky sap of the Hippomane mancinella, or manchineel tree, are closely analogous to those described by Mr. Otto, as resulting from his incautious meddling with the guao of Cuba, of which some further notice shall be given in a future paper. But, if popular opinion err not enormously on the side of exaggeration, the guao far exceeds even the dreaded manchineel in the activity of its powers, since Mr. Otto gives it as a prevailing belief, that *merely passing*, without *even touching the tree*, is attended with hazard; and his own example teaches us that *popular belief* should not be lightly rejected.

But in answer to the question, What is the plant which, under the name of guao, has earned such a fearful celebrity? Mr. Otto replies, in a note, that he "ascertained afterwards that this tree is the *Comocladia ilicifolia* of Swartz."

Upon referring to Swartz's Prodromus, I find the following brief notice of the plant here referred to, p. 17:—

CAMOCLADIA.

Ilicifolia. 3. C. foliolis angulato-spinssis.
Ilex. dodonæa, Spec. pl. 2. 182. L. Mant. 333.
Dodonæa, Plum. gen. 20. Ic. 118. f. 1.
India occidentalis, Antigua.

And on turning to my own manuscript Flora, I find that I met this very plant, spoken of by Swartz, growing on the heights above English Harbour and Falmouth Bay, and no doubt might have found it in other parts of Antigua, where it is known by the popular name of *holly-leaved maiden plum*, and also in the woods above Cape Henri, Hayti, where it blossomed in April; and in both of which localities I collected specimens not only with the most perfect impunity, but without being once cautioned as to any danger to be apprehended from handling it incautiously.

Like the rest of the genus it emits a glutinous juice, which communicates a very durable stain to linen, but is, in other respects, viewed as a perfectly harmless plant. Plumier's plant, referred to by Swartz, is evidently the same with the species I met in Antigua. "*Dodonæa aquifolii folio tricuspidato*," of which he describes a variety, without thorny leaves, growing in Puerto Rico. And Swartz, in his *Flora Indiæ Occidentalis*, vol. i., p. 75, changes the orthography of his Prodromus from camocladia to comocladia. But neither in these authorities, nor in the notes of my own experience, can I find anything to justify the statement made by Mr. Otto, in the note that he had "ascertained afterwards that this tree (the guao) is the comocladia ilicifolia of Swartz."

But there is a species of comocladia, the C. dentata, which I find described in my MS. as "C. caule subbiorgyali, succo glutinoso, äeris attactu nigricante, fœtidissimo, inquinante scatente, foliolis subpetiolulatis, sex-decemjugis cum impari, basi cuneatis, oblongis, acuminatis, aculeato-dentatis, suprà glabris, dorso venosis, subtomentosis, racemis plurimis terminalibus;" found both in Cuba and Jamaica, and known in the former by the name of guao, which seems more likely to be identical with Mr. Otto's plant, not only from the identity of its popular name, but from a certain resemblance in some of its properties. Jacquin, in his *Selectarum Stirpium Americanarum Historia*, p. 16, speaks of this tree as abounding "in sylvaticis circa Havanain;" and informs us that, "Cubenses *guao* appellant, asseruntque, *arboris, umbram subtus dormienti, sanguineo præprimis atque obeso, sæpius fuisse lethalem*, quam exemplis probare contendunt." His own experience, however, does not add much weight to the popular opinion, for he proceeds to say, "Ego aliquandiu sub hac arbore commoratus, *mutationem in me expertus sum nullam*;" admitting indeed that, "*ad somnum verò usquam experimentum prosequi non lubuit*."

Speaking of the sap he says,

> "Succus hujus arboris est lacteus, glutinosus, ad aëris attactum evadens omnium aterrimus, pannos *manumque inficiens nigredine*, in cute cumipsis demum detritis squamulis abscedente, in pannis nullà vulgari ne vel per annos repetitâ lotione delebili. Odor vero succi stercoreus est, et perfecte talis, qualis oriri solet ex aceto in sulphuris hepar instillato. Intacta arbor odoris nullum indicium præbet; sed, vel leviter vulnerata, dicto fœtori viciniam inficit brevi."

Lunan, in his *Hortus Jamaicensis*, vol. i., p. 476, confirms Jacquin's account, saying,

> "Juice milky, glutinous, turning very black, not to be washed from the skin or cloth. If the tree be ever so slightly wounded, it has a strong smell of dung. *The natives have a notion that it is dangerous to sleep under it.*"

Never having visited either Cuba or Jamaica, I can say nothing of the guao from personal observation. But, although both Jacquin and Lunan concur in assigning to it qualities sufficiently deserving of attention, neither of them even hints at its possessing any approaching in the least to those ascribed to it by the Prussian botanist. Jacquin describes it as distinguished for its almost branchless stem—"Caudice etiam est erecto, et in paucissimos ramos diviso;" but this is a character common to the genus, and particularly to the C. integrifolia, which possesses no other striking feature of resemblance, except the almost indelible stain of its sap, which might surely be converted to some valuable account, especially as the tree is of the easiest cultivation, being propagated by seeds, cuttings, or even by large stakes stuck in the ground. Independent of its sap, the timber of the Comocladia integrifolia, which I met on the banks of the Fountain river in St. Kitts—in the Dodand, Nevis, and in the woods above Cape Henri, Hayti (where it was in blossom in January, February, June, July, and August) is of a fine close grain, susceptible of a high polish, and well adapted for cabinet-makers' use. The sap of this species is wholly free from the smell of sulphuretted hydrogen ascribed by Jacquin and Lunan to the sap of the guao, although unnoticed by Mr. Otto, in his enumeration of the bad qualities of the tree of Trinidad de Cuba.

What then is it that causes this copious evolution of a fœtid gas from the Comocladia dentata? And is it not the emission of this gas during the night which renders it so dangerous, according to popular opinion, for persons of a plethoric habit especially, to sleep beneath its shade.

But there is yet another species, noticed by Humboldt, as growing in Cuba, and to which he assigns the vicinity of Trinidad as a locality, which I think more likely to prove identical with Mr. Otto's tree than any of the three previously noticed: this is the COMOCLADIA PROPINQUA, of *Humboldt's Nova Genera*, vol. vii., p. 16, and *De Candolle's Prodromus*, vol. ii., p. 4, 65, where it is also said to be called by the inhabitants GUAO. Of the physical properties of this species neither De Candolle nor Humboldt furnish the slightest information in the works to which I have referred; but the following specific character will enable travellers to recognize it:—"C. foliolis lanceolato-oblongis, acutis, subintegerrimis, suprâ glabriusculis, subtus hirto-tomentosis et ferrugineis."

This will probably be found to possess properties similar to those from which Mr. Otto was so severe a sufferer, and consequently those who make it the subject of investigation, will do well to approach it with caution, unless they are desirous of practically convincing themselves of the identity of its effects.

14, *Octagon, Plymouth, June* 20, 1845.

ON THE PROPERTIES OF SOME SPECIES OF CATHARTOCARPUS.

BY WILLIAM HAMILTON, M.B.

The genus Cathartocarpus (which, although reunited to Cassia by De Candolle, was, I cannot but think, judiciously separated from it by Persoon) possesses the distinct characteristic of pods more or less cylindrical, divided by transverse partitions into cells, each containing a single seed imbedded in a pulp, in general possessing a taste more or less sweet, accompanied by properties more or less actively cathartic. From this definition, the genus Cathartocarpus naturally embraces the two first sections of De Candolle's genus Cassia—fistula, and chamæfistula; the pods of the remaining sections being more or less compressed, and destitute of the cathartic pulp of the two first.

There can be little doubt that the pulp of the whole of the species belonging to the two sections of Cathartocarpus, namely, Cathartocarpi veri or fistula, and Cathartocarpi spurii or chamæfistula, consists of a cathartic principle modified in the different species by combination with other matters, which render its operation aperient or drastic, according to the degree of their presence. Could these principles be obtained in a separate state, there can be little doubt that they would be a valuable acquisition to Pharmacy, leaving it to the judgment of the practitioner to recombine them in his formulæ in the proportions best adapted to the nature of the complaint, and the exigencies of the case. The cathartic principle indeed, seems to be more or less present in all the species of both genera, exhibiting itself chiefly in the leaves and roots of the cassias, and the pulp of the cathartocarpi; and hence, as both are so widely and so abundantly dispersed throughout the Antilles, and indeed, throughout the whole of the intratropical portions of the American continent, it would amply repay the labour of the experimenter if he should succeed in obtaining this principle from those species which are most easily and cheaply attainable, and presenting it in a concentrated and more active form than that in which we receive it from the hands of nature.

On a review of each of these genera, we cannot fail to be struck with the manner in which nature appears to have arranged the species in two great sections, the one furnished with, the other wholly destitute of, glands: what influence the presence or absence of these glands may have upon the medicinal properties of the species, is a point to which I am not aware that enquiry has been hitherto directed, but as we cannot suppose that any organ has been created merely from caprice, we are forced to the conclusion that these glands answer some important purpose in the economy of those plants which are provided with them, and serve to elaborate some of those principles upon which their peculiar properties, economical or pharmaceutical, depend; and viewed in this light, they may serve as important guides to the experimental enquirer, and often save him much unprofitable labour. These, however, are offered as mere suggestions, resting upon no positive facts, and only to be taken for what time may show them to be worth.

The first section of Cathartocarpus subdivides itself into two subsections; the first of which, containing only two West Indian species in my MS. notes, is distinguished by a glandular rhachis, or common footstalk of the leaves—the other is without glands.

The two species belonging to the first of these subsections, are, the Cathartocarpus baccillaris found in Surinam, and the Cathartocarpus bicapsularis, a most abundant species, found in almost every hedge in Nevis, where it is known by the name of *black dog bush*. Of the medicinal properties of neither of these have I any record, but from the frequency with which the latter occurs, I think it highly probable that it will be found to possess qualities deserving of attention; and as its pods may be obtained in the greatest profusion by the way-sides at all seasons of the year, the pulp in which their seeds are imbedded, if it contain the active principle which I have conjectured to be common to its congeners, ever so sparingly, it may furnish it more economically than even those species which present it in a more concentrated form, but which are less abundant, and do not furnish their ripe fruit at all seasons. The black dog-bush is, I believe, a popular remedy among the blacks, but of their manner of using it, and its general effects, I must confess my ignorance. No notice is taken of it by Lunan, or any of the other writers on the botany of Jamaica; nor do I recollect to have once met it in Hayti, hence I am led to believe it is confined to the lesser Antilles.

The next subsection, containing those species whose rhachis is destitute of glands, presents us with at least two whose cathartic properties have attracted some little notice, even in England. These are the horse cassia of Jamaica, which has been hitherto referred to the Cathartocarpus Javanicus, from which more careful examination may be expected to show that it is specifically distinct; and the Cathartocarpus fistula, whose pods have long furnished the cassia fistula of the shops, the basis of so many purgative electuaries in Pharmacy.

The horse cassia, or as it might perhaps be conveniently distinguished, Cathartocarpus erubescens, from the pale carnation or blush colour of its blossoms, totally different from the bright golden hue of all the other species, is a tree of from eighteen to twenty feet in height, frequent in Brazil, and in the lowland woods of Jamaica adjoining the sea, and on the margin of rivulets. Its blossoms are remarkable for their exquisite fragrance, which is perceptible to a great distance, on those calm, sultry, cloudy evenings especially, in which the atmosphere is loaded with vesicular vapours. They are succeeded by the long, black, cylindrical legumes of the genus, externally marked with three longitudinal nerves, and divided into numerous cells by transverse partitions, in which its subcompressed seeds are found enveloped in a black drastic pulp, whose operation upon the human frame is so rough and disagreeable, that it has long been consigned to the service of cattle, and of horses more especially; a circumstance from which its common English name has been derived. The unripe pods are said to be astringent, and the tops of the leaves are applied as dressings to wounds. It does not appear to exist in any of the lesser islands, at least I have never seen a specimen, nor was I more fortunate in those parts of Hayti in which it was my fortune to reside. What is the acrid principle which excludes this pulp from the purposes of pharmacy? and could it not be separated from it, so as to render it milder and less disagreeable in its effects?

The next species is the Cathartocarpus fistula, the cassia stick tree of *Lunan's Hortus Jamaicensis*, vol. i., p. 164, where it is spoken of as an exotic in Jamaica, although from Dr. Broughton's catalogue of East's garden, it appears to be indigenous. Lunan speaks of it as attaining a height of forty or fifty feet. In Dominica however, and in Hayti, in both of which I have met it in flower in the months of May, June, and July, I did not observe it of more than half that height. When in blossom, loaded with its pendant racemes of golden flowers, it is one of the most lovely objects I ever beheld, of which the laburnum of our gardens furnishes but a faint representation. The pulp of the legumes, which are often more than two feet in length, is obtained separate from the seeds, by straining through a coarse cloth; and, when the pods have reached their proper stage of maturity, it is sweetish, and not very disagreeable to the palate. Such is the estimation in which it is held by the French, that on their reduction of Dominica, in September, 1778, a royal ordinance, as Attwood informs us in his history of that island, was published at Roseau, requiring the planters to make a correct return of all the cassia trees growing on their respective estates. The aperient properties of this pulp are said to be improved considerably by combination with half its weight of manna, the compound being more active than three times the quantity of cassia, or sixteen times the quantity of manna alone. Long, in his *History of Jamaica*, observes, that the finest fruit is produced from trees growing in rich deep mould, in some bottom or vale, warm and well sheltered; adding, that it is not wonderful that the quality should degenerate, when no pains are taken in the cultivation. This is one of the ruinous results of that *exclusive* attention to the culture of the cane which the monopoly of the home market has produced, and which we cannot hope to get rid of, so long as that monopoly is suffered to continue.

But independent of the valuable properties of its pulp, and its high claims to attention as an ornamental tree, the Cathartocarpus merits consideration for the beauty of its timber, which presents a fine close grain, susceptible of a high polish, and well suited for ornamental furniture, and for turnery. I have in my possession a snuff-box turned from a piece of this timber, sent to me from Carthagena, which has been justly admired. In addition to which, this timber or its raspings, gives out to spirit a rich red colour, which dyes silk of a beautiful pink, and if the colour could be rendered more durable, it would be a valuable acquisition to the dyer.

To what particular use the cassia pulp is applied by the inhabitants of Dominica, I am not informed; but Attwood says, very little is exported. Possibly from that apathy which is the besetting sin of warm climates, the pods are suffered to perish neglected on the trees which produce them.

14, *Octagon*, *Plymouth*, *June 24th*, 1845.

ESSENCE OF CAMPHOR.

BY MR. H. COCKAYNE, M.P.S

℞ Tr. Myrrhæ, ℥ss.
Sp. Vini Camph, ℥iss.
Sp. Vini Rect., ℥iv. M.

The myrrh renders the spirit of camphor miscible with water, without which it would be decomposed. To deprive the myrrh of its colour, add to it some animal charcoal. (About fifty drops will make a pint of ordinary camphor julep).

The mode of administering camphor in suspension by mucilage, is entirely obviated, by the myrrh suspending the camphor in the minutest state of division, and in a perfectly miscible state.

Sheffield, *August* 18*th*, 1845.

VETERINARY MEDICINES.

Antispasmodics, *Narcotics*, and *Sedatives*.—Antispasmodics (from *αντι*, *against*, and *σπασμος*, *a spasm*,) are medicines which possess the power of allaying or removing inordinate or painful motions in the system, especially those involuntary contractions which take place in muscles naturally subject to the command of the will. Narcotics (from *ναρκοω, to stupify*) medicines which have the power of procuring sleep; and sedatives (from *sedo,* to ease or assuage)—medicines which have the power of diminishing the animal energy, without destroying life, are used to allay or diminish spasmodic action in the body.

ANTISPASMODIC DRAUGHTS.

No. 1.

℞ Tincture of Opium ʒj—Spirit of Nitric Ether ℥ij—Aloes ʒss—Proof Spirit ℥ss—Water ℥iv. Mix for a draught. [*Morton.*]

No. 2.

℞ Opium, Camphor, each ℥ij—Spirit of Hartshorn ℥j—Oil of Turpentine ℥ij—Strong Ale Oj. Mix for a draught. [*Blaine.*]

No. 3.

℞ Pepper ℥ss—Oil of Turpentine ℥iij—Tincture of Opium ℥j—Strong Ale ℥iv. Mix for a draught. [*Blaine.*]

No. 4.

℞ Tincture of Opium ℥ij—Ether ℥j—Oil of Peppermint ʒj—Strong Ale and Gin, each ℥v. Mix for a draught. [*Blaine.*]

No. 5.

℞ Oil of Turpentine ℥ij—Oil of Peppermint ʒj—Castor Oil ℥vj—Tincture of Aloes ℥iij. Mix for a draught. [*Blaine.*]

No. 6.

℞ Pepper ℥ss—Gin ℥v—Strong Ale ℥v—Juice of two or three large onions Mix for a draught. [*Blaine*].

No. 7.

℞ Asafœtida ℥ss—Squills ʒj—Soap ʒij—Oil of Turpentine ʒij—Balsam of Peru ʒss—Water ℥iv. Mix for a draught. [*White.*]

No. 8.

℞ Digitalis ʒss—Extract of Hemlock ʒij—Water Oss. Mix for a draught. [*White.*]

ANTISPASMODIC CLYSTER.

℞ Decoction of Poppies Cong. j—Camphor ℥j dissolved in spirit. Mix. [*Blaine.*]

ON THE METHOD OF PREPARING MEDICATED TINCTURES.

BY HENRY BURTON, M.D.
Physician of St. Thomas's Hospital.

[*Concluded from our last, p.* 83.]

Remarks.—*Tinctura Aloes.*—The dissolution of good socotrine aloe, coarsely powdered, and suspended in spirit of the strength directed to be used in making the officinal tincture of aloe, proceeds uninterruptedly without agitation, and, when perfected, very little residue will remain in the bag. The resulting tincture will obtain its maximum density in forty-eight hours, and no change in its specific gravity will be occasioned by subsequently agitating the materials together in direct contact. Aloe only is thus exhausted by suspension; but if, instead of macerating aloe alone in a bag, it is macerated in admixture with the extractum glycyrrhizæ, another component of the tinctura aloes, then the tincture will not attain its maximum density in forty-eight hours, and on opening the bag after this interval, a considerable bulk of feculent residue will be exposed, mingled with portions of the original liquorice, which cannot be entirely exhausted until the materials have been agitated together in direct contact. By subsequent agitation the specific gravity of the officinal tincture made by suspension in forty-eight hours was raised three units in the third place of decimals, or from 0.996 to 0.999. The difference, however, might be diminished by protracting the maceration by suspension a few days, and by draining the bag of solids, so as to favour the circulation of the tincture through them, once daily; but as the source of the difference is in the loss of liquorice, and not of aloe, the medicinal virtues of the preparation will not be seriously affected by it, and the deficiency of saccharine taste might be compensated for by the use of a rather larger quantity of liquorice than directed in the London Pharmacopœia of 1836. The plan suggested by Dr. Duncan, in reference to exhausting substances of different degrees of solubility used in making compound tinctures successively in spirit, does not seem to be preferable in this instance to the ordinary plan of macerating all the components together, and failed in one trial to increase the specific gravity of the tincture of aloe.

Tinctura Aloes Composita.—Rectified spirit is a very good solvent of aloe, and is used in making its compound tincture under the form of tincture of myrrha. The dissolution of coarsely powdered aloe proceeds without cessation to its completion, and requires no assistance from shaking. The resulting tincture attains its maximum density on the second or third day of suspension, and if the aloe was of good quality, and no crocus used, very little residue will remain in the bag; the tincture may be drained from the residue for the most part, and little or no additional quantity would be obtained by subsequent compression, if prepared without crocus. In preparing the officinal compound tincture of aloe crocus is used, but none was employed in the one noticed in the preceding table; consequently its specific gravity is lower than that of the officinal tincture, and the hard extract yielded by a fluid drachm consisted only of the resin of myrrha and aloe.

Tinctura Balsami Tolutani.—Balsam of Tolu is very soluble in spiritus rectificatus, and its tincture is best prepared by suspension in a bag, by means of which its agglutination to the bottom of the macerating vessel, and which occurs in the ordinary process, and the necessity of filtering after maceration, are obviated. The resulting tincture was quite clear at 62°, but became turbid when cooled down below 45°: its density was precisely equal to a similar tincture made by direct contact and agitation, and only a very small quantity of residue was left in the bag from which almost all the tincture was drained.

Tinctura Calumbæ.—Spiritus tenuior is used in a large proportion to the calumba in making its tincture, and effectually exhausts it in less than forty-eight hours by mediate contact and suspension, unaided by agitation. The resulting tincture is obtained clear, and precisely resembles a similar one made, *cæteris paribus*, by agitation with direct contact, and may be, for the most part, drained from the fibro-amylaceous residue of the calumba, without incurring waste; but the expressed tincture is rather stronger than that which is drained from the bag.

Tinctura Asafœtidæ.—A large portion of the resin and oil of asafœtida is quickly dissolved by spiritus rectificatus in mediate contact, but its gummy component towards the close of the maceration forms an insoluble residue, which retards the exhaustion of the last portions of it, in the same way as the feculent residue obstructs the dissolution of the last portions of liquorice used in making the tincture of aloe. The perfect exhaustion of asafœtida by spiritus rectificatus cannot be accomplished in two or three days by either of the two processes under consideration, and in seven days the tincture made by direct contact and agitation was a little stronger than that made by mediate contact; but in equal periods of time the tincture made by the one possessed very nearly the same specific gravity as that made by the other process, and by protracting the maceration by suspension to seven days, as well as taking the precaution to drain and reimmerse the bag daily, the tinctures will be found closely to resemble one another in all respects. No difficulty attends on the packing: the bulk of the asafœtida is small in proportion to its solvent, and very little tincture adheres to the bag of residue after the final draining. The asafœtida used in my experiments was soft, and cut into small fragments; but for the purpose of favouring the circulation of the tincture through it, it should be reduced to a coarse powder in a cold mortar.

Tinctura Cascarillæ.—Spiritus tenuior quickly acts on the cascarilla suspended in it, and the resulting tincture, at the end of two days, will precisely resemble one made by the ordinary process, *cæteris paribus*, in ten days. The bark should be reduced to a coarse powder, and, as its proportional bulk is small, it may be enclosed loosely in a bag, and will be effectually covered by the spirit. The resinous nature of cascarilla favours the circulation of the resulting tincture, and no extraordinary attention is required to ensure the success of the process. It is scarcely necessary to raise the bag until the end of the maceration, when a large proportion of the tincture may be obtained without the aid of pressure, by draining, and quite clear.

Tinctura Cinchonæ Pallidæ.—Cinchona is rather bulky, and when used in coarse powder, it may be packed in a bag sufficiently small to admit of being effectually covered by the proportional quantity of spirit in which it is to be macerated. The resulting tincture attains its maximum density in forty-eight or seventy-two hours, and will then resemble in all its sensible qualities a similar tincture made with materials of equal goodness by direct contact and agitation in ten days. The tincture is quite clear, and about one-sixth of the original quantity of spirit is retained by the residue after draining; which, for the most part, may be expressed; and the bark loses by maceration about twenty-five per centum of its weight, consisting of water and extract soluble in spiritus teniuor.

Tinctura Conii.—This tincture is made with great ease by suspension, and attains its maximum density in two days. At the end of this time it will resemble a similar tincture made with materials of equal goodness in all its sensible qualities, and be perfectly clear. The herbaceous structure of conium is favourable to its compression within the requisite compass, and its bulk may be sufficiently reduced in a bag without rendering it impervious to the proportional quantity of spirit in which it is to be macerated. The bag should be drained once or twice during the process, and after the final draining a quantity of tincture will continue to adhere to the residue until expressed. This step may be taken immediately after the draining has ceased, and the economy of time as well as spirit which is ensured by preparing the conium in its dry state, for the subsequent expression of its tincture, strongly recommends this process in preference to the ordinary plan.

Tinctura Digitalis.—Spiritus tenuior acts very readily on, and its proportional quantity is amply sufficient to cover, digitalis under moderate pressure, suspended in it. The resulting tincture attains its maximum density in two days, and, if prepared with the mature leaf, thoroughly dried, will have a specific gravity of 0.934; but if the immature leaf is substituted, and its dessication neglected, the specific gravity of the tincture made with it will be much higher, and has sometimes reached 0.972. But the specific gravity of the best kind of this tincture never much exceeds 0.944; and when above 0.958, its medicinal virtues, according to my observation of its effects at St. Thomas's Hospital, and which were noticed in the *Medical Gazette* for June 1841, cannot be trusted. The bag process is extremely well adapted for making this tincture, and surpasses the ordinary method in most respects, but more especially as regards the economy of spirit, as well as of the attention required to conduct it.

Tinctura Guaiaci.—Guaiacum reduced to a coarse powder, or small fragments, and suspended in a bag, dissolves in spiritus rectificatus with almost the same rapidity as sugar melts in water. The resulting tincture attains its maximum density in one day or thirty hours, and the bag retains, after being drained, only a very small proportion of tincture, besides the usual impurities of the drug. Guaiacum is rather bulky compared with the proportional quantity of spirit in which it is suspended; but it is so very soluble, that the full bag may be at first suspended half above the spirit without prejudice to the process, but as soon as the contents of the lower half have given place for the most part to those of its upper half, the whole bag should be lowered into the solvent. The same remarks apply to the preparation of the officinal tinctura guaiaci composita, and in making both tinctures, the inconvenience which arises from the adhesion of the guaiacum to the bottom of the macerating vessel in the ordinary method is obviated by the intervention of the bag.

Tinctura Hyoscyami.—Notwithstanding the bulky nature of hyoscyamus, a very moderate degree of pressure will suffice to contract its bulk within the requisite limits, and it may be effectually macerated in the proportional quantity of spirit. The resulting tincture attains its maximum density on the third day, and resembles in all respects a similar tincture macerated eight days by the ordinary process; but as a considerable portion of the tincture is retained by the hyoscyamus after draining, moderate pressure subsequently applied to the bag will be required to separate it. Its separation may be effected with little or no comparative waste of tincture; and for reasons similar to those given in reference to the tinctura lupuli, this part of the bag process far excels in its economy that of the ordinary method.

Tinctura Jalapæ.—Jalap should be macerated in the form of a coarse powder, and not be finely pulverized; it is rather bulky, but with the ordinary precautions before frequently alluded to it may be effectually covered by the proportional quantity of spirit in which it is to be suspended. A considerable proportion of pulpy residue, intermingled with a little jalap, remains in the bag towards the close of the maceration, and, for the purpose of aiding the circulation of the solvent through it, and of exhausting the jalap, the bag should be raised once daily and drained. About one-seventh of the original quantity of spirit is retained by the bag of residue after the final draining, and the resulting tincture attains its maximum density on the third or fourth day, when it will be found to resemble in all respects a similar tincture made by the ordinary mode, with much more trouble, in fourteen days.

Tinctura Kino.—Kino is very soluble in spiritus rectificatus, and its tincture is made by the bag process with the greatest facility in twenty-four hours, at the end of which time it will have acquired its maximum specific gravity, and resemble, in all respects, a tincture made, *cæteris paribus*, by the ordinary method. A small proportion of residue, insoluble in spirit, remains in the bag, varying, however, with the kind of kino employed, but which never exists in quantity sufficient to interfere with the action of the solvent, nor to retain the tincture by adhesion, and seldom varies more than between ½ to 7½ per centum of kino. In the ordinary process of making this tincture, the kino, after being softened by the spirit, adheres to the bottom of the macerating vessel, and from which it is best detached by violent agitation; but this additional labour is obviated by the intervention of the bag; and simple draining only, at the termination of the maceration, will separate almost all the tincture from the residue.

Tinctura Lupuli.—The bag process is admirably suited for making the officinal tincture of hop, and obviates, in great part, the loss by evaporation consequent upon the tedious transfer of the strobilus, saturated with tincture, from the macerating vessel to the press and filter, which is requisite to be made in the ordinary process, and a moment's comparison of the steps of the two processes will serve to show the great superiority of the bag over the ordinary process. The hop employed in making the officinal tincture retains, after the final draining of the bag at the close of the maceration, very nearly one-half of the resulting tincture; the other half can be drained from it without loss, but the portion which adheres to the residue can only be separated by pressure, and its separation is affected with much greater celerity, and with much less waste from the hop now moist, but which had been previously enclosed whilst dry, in the bag, which now serves also as a filter, than from the moist hop compressed in and adhering to the sides of an ordinary macerating tub, and from which it has to be transferred to a filtering cloth, and submitted to the press. No impediment to the exhaustion of the hop is caused by the pressure which is required to contract its bulk within a compass sufficiently small to be covered by the proportional quantity of spirit in which it is macerated; but the circulation of the solvent will proceed freely through the solids, and in less than thirty hours the resulting tincture will have attained a specific gravity equal to that of a tincture made in eight days, and greater than another made in an equal period of thirty hours by the ordinary process.

Tinctura Myrrhæ.—Myrrha should be used in the form of a fine powder, and is soon deprived of its oily and resinous components by spiritus rectificatus, through the bag in which it is suspended; but in consequence of the large proportion of its gummy component, which is insoluble in rectified spirit, and forms a residue in the bag, intermixed with myrrha, the circulation of the resulting tincture is retarded towards the end of the maceration, and hence it is requisite to favour the dissolution of the last portions of myrrha by raising and draining the bag once or twice during the process. With this precaution, the resulting tincture attains its maximum density in two or three days, and will resemble in all respects another tincture made with materials of the same quality by agitation in twenty days. But the qualities of commercial myrrha vary, and it will be perceived by inspecting the table, that the quantity of hard extract yielded by equal measures of different tinctures was very unequal. The most fragrant and palatable tincture possessed the highest specific gravity, but afforded a less proportional quantity of extract, as represented by the figures on line No. 3, than the least fragrant tinctures, noticed on the lines Nos. 1 and 2. Very little tincture adheres to the residue after draining, and subsequent pressure may be dispensed with, without incurring any serious waste.

Tinctura Opii.—The proportional quantity of spiritus tenuior effectually covers the opium employed in making this tincture, and reaction begins in a few minutes after the materials have been placed in mediate contact. The opium should be used finely pulverized, and when loosely packed its dissolution will proceed satisfactorily for the first twenty-four hours without interruption, through the bag in which it is suspended. But at the end of this interval the heavier tincture will have gravitated towards the bottom of the macerating vessel, and the rate of solution will be slower. Hence, with the object of equalizing the specific gravity of the several strata of tincture, and of favouring the dissolution of the last portions of opium intermixed with the various substances which it contains insoluble in spiritus tenuior, it will be proper to drain the bag of residue, and, as soon as drained, to reimmerse it in the tincture. The draining and reimmersion should be repeated once daily, or every second day; and lastly, after the final draining, the residue should be compressed. By taking these precautions, the tincture will attain its maximum density about the sixth day of maceration, and resemble in all respects a similar tincture made *cæteris paribus* by direct agitation in the same length of time.

The results exhibited on the lines Nos. 1 and 2 were obtained from experiments on two portions of the same kind of opium, and are rather favourable to protracted maceration, but do not affect the question of suspension; for it will be perceived by the results on lines Nos. 3 and 4, obtained from an experiment upon one portion of another kind of opium, that when the time of macerating opium by suspension is equal to that during which it has been macerated in direct contact with spirit, then the specific gravities of the resulting tinctures will be also equal.

Tinctura Scillæ.—The dissolution of squill in spiritus tenuior proceeds slowly after the first day or two of its maceration by suspension; and the precautions requisite to ensure the success of the process are analogous to those noticed in reference to making the tinctura opii. The tincture of squill cannot be made by either process, of the greatest strength, with the materials directed to be employed, until after the fifth day of maceration; but on the tenth day the exhaustion of the squill was completed by both processes, and the tincture made by suspension resembled in all respects another made by the ordinary process in the same interval. Squill when saturated with spiritus tenuior is viscid, and in consequence of its consistency the circulation of the weak tincture through it is languid towards the close of the process, and requires to be accelerated by gravitation in air; but with the precautions above noticed, and packing the bag loosely, the squill will be exhausted in the same interval by the bag process as by the ordinary process, and the saturated residue be ready prepared for the press after its final draining. The bag and residue retain after draining about one-fifth of the original quantity of spirit employed; and this portion cannot be collected in the form of tincture until expressed.

Tinctura Valerianæ.—Valerian is readily deprived of its soluble components by spiritus tenuior in forty-eight hours; it should be packed loosely in a bag, and is effectually covered by the proportional quantity of spirit.

I beg, in conclusion, to observe, that in the experiments before referred to, the compression applied to the bag after draining was only moderate, and not powerful; and consequently, as expressed are often stronger than drained tinctures, the specific gravities of several of the tinctures named on the table are probably less than they would have been had more force been exerted; but as the residues in both processes were subjected to an equal amount of pressure, a fair comparison may be drawn between the foregoing results. It has been above stated, and the statement was founded on experiments, that a considerable proportion of the tincture is retained by the residue when bulky, and which can only be effectually separated from it in the form of tincture by forcible compression. The expressed tincture was stated also to be in some instances stronger than the drained tincture; hence, with the object of economizing the tincture, and obtaining it of the greatest possible strength, pressure must be applied to the residue. This requisite compression can be effected, I repeat, with greater facility and less waste of spirit, by transferring the packed bag after its final draining, from the macerating vessel to the press, than is practicable by the old plan of agitation. The consumption of spirit in the bag process is also less than in that of percolation and displacement in all the examples in which the residue are bulky, and retain a large proportion of tincture. For in my experiments with a percolator, similar to one described by Dr. Christison, it was impracticable to remove the residue from the vessel to the press without waste; and with the view of separating the tincture adhering to the saturated residue in the percolator, by the addition of a portion of fresh spirit, equal in quantity to the bulk of tincture retained by it, after the manner proposed in books, I found the resulting tincture, after the addition, to be weaker than the tincture which had been previously percolated. The displacement cannot be effected by the purely mechanical gravitation of the fresh spirit, but a combination must previously ensue between it and the adhering tincture when brought into contact, and the latter is consequently obtained in a diluted form. The plan, also, of recovering the fresh spirit, on a principle of economy, by subsequently pouring water on the residue, and distilling the diluted spirit, is also objectionable, as being attended with expense and trouble, and as, moreover, producing a rectified spirit, which, after volatile substances had been macerated in it, would be flavoured by them, and rendered useless for many purposes. On the score, therefore, of economy, the process of percolation can scarcely remunerate the Pharmaceutist; and notwithstanding the experienced opinion of Mr. Bell, stated in the *Pharmaceutical Journal* for April, 1845, I presume to repeat my impression, that the process of percolation is far more expensive, more difficult to perform, and less generally applicable to the preparation of medicated tinctures, than the plan of macerating substances packed in bags and suspended in spirit.—*Medical Gazette.*

ON YEAST,
WITH REFERENCE TO THE PHENOMENA OF FERMENTATION.

BY DR. T. SCHLOSSBERGER.

[*Concluded from page* 44.]

I. Fresh yeast from the upper part of the vessel (Oberhefe) purified in the manner described, and dried at 212° Fahr., yielded, on combustion with chromate of lead after subtraction of the ash amounting to 2.5 per cent., the following results:

Carbon	50.05	49.84
Hydrogen	6.52	6.70
Nitrogen	11.84	12.44
Oxygen	31.59	31.02
	100.00	100.00

II. Yeast from a second barrel purified in the same way, gave a very slight difference only. The nitrogen amounted to 11.63 per cent.

III. Yeast from the bottom of the vessel which had stood six days at 50° Fahr., where the cells were in a normal state, and which showed no traces of decomposition, gave on subtraction of the ash amounting in this case to 3.5 per cent., the following results:

Carbon	48.03	47.93
Hydrogen	6.25	6.69
Nitrogen	9.80	9.77
Oxygen	35.92	35.61
	100.00	100.00

IV. The same yeast, which in No. I. had yielded about 12 per cent. of nitrogen, after standing a week with some beer at a temperature of 50° Fahr., evolved a quantity of carbonic acid, and contained less nitrogen, viz., 9.14 per cent.

The quantity of nitrogen found in these experiments differs greatly from that given by Dumas (15 per cent.) for it varied only from 9 to 12 per cent. according to the age and quality of the yeast. The subsequent analyses will show that the cellular tissue of the yeast globules contains no nitrogen; but is, as it were, the skeleton for it, and cannot be conceived without it. This admixture must lower the quantity of nitrogen of the proteine forming the contents of the cells, and both Marcet and Mitscherlich found accordingly only 7 and 10 per cent. of nitrogen. Elementary analysis appears to prove that the composition of yeast varies as the yeast undergoes continual change on exposure to air and water, and is thus subjected to analysis at different stages of decomposition; where there was a diminution in the quantity of nitrogen, a diminution of carbon was likewise found, which we may explain by supposing cells to take up the carbon in excess, while the more carbonaceous proteine disappears. It has long been known, that on adding an excess of sugar to yeast, all its nitrogen gradually disappears, and the insoluble residue (so called *hordeine*) which is incapable of exciting fermentation, is devoid of nitrogen, whilst in composition it is supposed to be similar to amylum. Doebereiner had shown that the spirituous fluids contain always salts of ammonia. Bracconot had found a large quantity of nitrogen, but he experimented on wine lees, where there appears to be a combination of tannin with the proteine of the yeast. That the pure cells of yeast contain sulphur appeared undeniable, but the quantity was too small to be determined. The very small quantity of sulphur found in yeast led me to question whether sulphuretted hydrogen was evolved during the process of vinous fermentation. To determine this question, I made with Dr. Doepping the following experiment:—A strong glass tube bent at two right angles was hermetrically fixed to a beer barrel, where fermentation was actively going on, and connected with a large receiver, in which the fluid, froth, and yeast was retained; the carbonic acid escaping was made to pass through several cylinders, filled partly with a solution of chloride of mercury, partly with sulphate of copper; the gas which was not taken up, passed thence through several vessels filled with milk of lime; it easily overcame the high pressure, and was at last collected in bottles over water. After a large quantity had passed over during several hours, no change of colour or precipitate was observable in the metallic solutions above mentioned, so that no trace of sulphuretted hydrogen (or phosphuretted hydrogen) had been disengaged; but with much carbonic acid gas which was not entirely absorbed, a small quantity of a gas passed over into the bottles, which was not absorbed by a solution of potash and was not combustible; a candle burnt faintly in it; it was probably only atmospheric air.

The sulphur contained in yeast was best shown on Creuzburg's principle, by boiling with potash, and then adding an acid in a closed vessel in which a paper saturated with carbonate of lead was suspended. Burning with saltpetre or boiling with nitric acid, gave less decided proofs of its presence. Whether yeast contains phosphorus must remain an undecided question, as with all the proteine substances; the ash, which amounted often to 4 per cent., contained large quantities of phosphate of lime and magnesia, sometimes iron and traces of alkalies. It was now necessary to examine the proximate constituents of yeast cells separately. In testing with alkalies, it was observed that they dissolved a substance leaving the cellular membrane intact. This was an indication to a method for *separating the contents of the cells from the membrane.* Yeast purified in the manner described, was heated repeatedly with a very weak solution of potash, and thus (but after many days not perfectly) a nitrogenous substance allied in properties to the group of proteine substances was extracted. It is advisable to use a very dilute solution of potash, as an evolution of ammonia is scarcely to be prevented, for the proteine of yeast is distinguished from this group of substances by its extraordinary proneness to decomposition.

The potash solution is of a bright yellow colour, and formed a flocculent precipitate with all the acids, but an excess of acetic acid redissolved the precipitate when scarcely formed; on adding acids to this solution, an odour of sulphuretted hydrogen was evolved. The precipitate with acetic or sulphuric acid consisted in the moist state of pure white flocculi, difficult to wash, brittle, and when dried, transparent like horn, and of a yellow colour. This precipitate was perfectly soluble in acetic acid, whence it was again thrown down by ferro-cyanide and ferridcyanide of potassium; concentrated muriatic acid rendered it of a beautiful violet tinge, but never perfectly blue; on boiling with it, a brown solution was produced, whence brown flocculi separated. On washing the precipitate obtained by sulphuric acid, nearly all the acid may be washed out so that a trace of it can only be detected on boiling with nitro-muriatic acid. The substance when dried at 212° Fahr. was of an amber colour, on heating the powder, it became strongly electrical, and burnt with a strong odour of burning horn, leaving no residue.

Carbon	55.53	55.53
Hydrogen	7.50	7.50
Nitrogen	14.01	13.75
Oxygen	22.96	23.22
	100.00	100.00

These results do not correspond with the analysis of proteine, which contains more nitrogen, but very much with an analysis of a modification of caseine by Mulder, in which he found,

Carbon	55.45
Hydrogen	7.31
Nitrogen	14.00
Oxygen	21.84

with traces of sulphur and phosphorus.

In the analysed substance of the yeast no sulphur was present after it was obtained. It remains undecided whether the proportionately small quantity of nitrogen is a consequence of the trivial development of ammonia, which, as before mentioned, very dilute potash produces in the cells of yeast, or whether this product is a modification of proteine.

The potash solution, when precipitated with mineral acid, was still of a yellow colour, and yielded on evaporation and purification from the potash a yellow brown extract, which on account of the small quantity was not examined, and may be regarded as a product of decomposition of proteine, produced by fermentation or by the potash. On one occasion, I observed a turbidity in the clear fluid over the precipitate, produced by acid, and the microscope detected similar (vegetable?) formations to those which *Andral* and *Gavarret* had seen, develop themselves in several albuminous acidulous fluids, and which they have classified, although of the most multifarious forms, under the name of *Penicillium glaucum*; in this case, these formations were also incapable of producing fermentation in sugar and water.

If the contents of the cells be allied to the Proteine substances, the *cellular membrane* of the yeast cells approaches, in its chemical character, the group of amylum or cellulose, a relation in favour of its vegetable nature, and removing it from the class of animal cells. The cellular membrane of yeast is distinguished by its resistance of even energetic chemical reagents. Concentrated solution of potash decomposes it with difficulty, only concentrated mineral acids (but not muriatic) decompose it; but acetic acid has no effect on it beyond making it shrivel, by entering it by endosmose, and dissolving or extracting the contents of the cells. It is very difficult to free it totally of its proteine, but I succeeded in purifying it so far, that on determining the quantity of nitrogen, I found only one-half per cent. After treating it during eight days with renewed additions of an aqueous solution of potash, it was washed with acetic acid and afterwards with water, until the latter left no residue on evaporation; I carried this on until the ash scarcely reacted as an alkali. The fresh moist cellular membrane is of a dirty white colour; the microscope clearly shows the empty membranes, but these intact; iodine renders them yellow, but gives no trace of a blue colour. When dried the membrane becomes bright yellow, is not very easily reduced to powder, burns without ammoniacal odour, and leaves about one per cent. of mostly pure white, rarely brown, ash.

Elementary analysis with chromate of lead gave

Carbon	45.45
Hydrogen	6.87
Oxygen	47.68
	100.00

But with oxide of copper and chromate of potash, the results

Carbon	45.09
Hydrogen	6.60
Oxygen	48.31
	100.00

Two analysis with oxide of copper alone gave too small a quantity of carbonic acid.

These results show the cellular membrane of yeast to be allied to that of Lichens, of which Heldt and Rochleder give the following composition:

Carbon	46.08
Hydrogen	6.67
Oxygen	47.25

and it approaches still closer to several ligneous fungi which I am now examining with Dr. Doepping, and whose carbon varies between 45.0 and 45.5 per cent. As it is almost impossible to free the cellular membrane perfectly from a residue of proteine, the quantity of carbon found in these analyses may be rather too high; but by lowering it, not quite one per cent., it would correspond with cellulose and amylum. An isomerie, as it is termed, with starch, might be concluded on with more probability by the following experiment:—If pure cellular membrane of yeast be boiled for several days with dilute sulphuric acid, a portion of it is dissolved. The solution was now evaporated, heated, and reduced to ash, with potash and sulphate of copper, when on heating a beautiful red oxide was produced, and on adding yeast a copious development of carbonic acid gas took place. We have here then the paradoxical result of *sugar being formed from yeast*, which decomposes sugar. But this is not surprising, since Piria has described a process of fermentation, during which sugar is formed (from Salicin and Emulsine). Several experiments were performed to determine the *origin* of the yeast cells which remained inconclusive.

I need only refer to the presence of small granules in several sorts of flour, which are not rendered blue by iodine, and resemble the globules of yeast remarkably in form and appearance; but in a filtered perfectly clear solution of malt, covered with paper, in which when fresh there were no cells, a turbidity took place in a few days, accompanied by a decided development of cells. The same phenomenon was observed in a solution of Secale cornutum to which sugar was added. I never could perceive a budding or bursting of the yeast cells, accompanied by a discharge of their contents; nor could I ever produce this by compression. Those curious filiform brachial and other adjustments of the cells of yeast to each other, appeared to me the work of chance; whereas, others have considered them a transition to higher vegetable organization, as Turpin, who saw in these changes microscopic plants of a higher order developed in the Torula cerevisiæ. The generation of these cells remains still a mystery; and the question of generatio æquivoca and original creation is as far from being solved as ever. The experiments of Schulze and Schwann, and recently those of Helmholz, tend to show that the mere access of heated air to the juice of fruits produces no vinous fermentation or formation of yeast, but they leave much doubt on the subject.

It has recently been urged with much truth, that it is impossible to draw a line of distinction between inorganic and organic nature. It has been said that the first act of formation of cells is inorganic: a precipitation or deposition of a molecule round which cellular membrane is formed by a peculiar arrangement of the nuclei of the cells. According to Schleiden nitrogenous and non-nitrogenous substances are necessary to the formation of primary cells, both of which we find in the juices of plants; but it is impossible to determine the commencement of organic life. In favour of Schwann's analogy between the formation of cells and crystallization, I find another point of resemblance in the fact that Gay Lussac, who proved the necessity of the presence of at least one atom of oxygen to produce fermentation (and formation of yeast cells) in vegetable juices, found that if crystallization did not take place in concentrated solutions of salts in vacuo, the access of a small quantity of air would instantly bring on that action. The real generation of yeast cells in suitable fluids under favourable circumstances appears to me quite as probable as the opposite theory, which assumes that the germs find these fluids favourable places for their further development; and the increase of yeast in fermenting fluids does not perhaps depend so much on the multiplication of the cells as in a continued process of generation of them. It might yet be questioned whence the cellular membrane is to be derived? Whether from sugar or gum, or a decomposition of proteine and escape of ammonia? But these must remain a problem for future investigation.

The dispute whether the yeast cells belong to the animal or vegetable creation is perfectly useless. The first examiners, among whom was Desmazièrs, declared them to be of animal structure, the latter considering them an *animalcule monade*, which he termed *Mycoderma cerevisiæ*. The cellular membrane being non-nitrogenous would argue for its vegetable origin; but it is a matter of indifference whether we class the cells with the fungi or algæ, though they are evidently allied to the protococcus, &c. The *primary cells* might with some reason be considered a *peculiar class*, as nearly allied to the lowest animal structure as to vegetable formations, without belonging to either, for the chemical relations under which these cells are formed differ much from those necessary for the formation of vegetable and animal organism. Certainly, the laws of higher organic life should not, strictly speaking, be applied to that of the lowest order (Infusoria, which exhale oxygen, according to Wöhler and Morren). Are starch globules plants? Are the globules of blood or spermatozoa animals?

I made some few experiments on the *modus operandi* of yeast, which Professor Liebig had the kindness to confirm. If superoxide of hydrogen be added to fresh yeast, a quantity of oxygen is instantly disengaged; it also decomposes sulphuretted hydrogen very rapidly, if slightly shaken. When yeast was boiled this action was soon brought to a termination. Yeast did not decompose amygdaline. Yeast which had passed into a state of putrefaction (not longer than twenty-four hours) might be arrested in this process by addition of sugar, when all disagreeable odour disappeared, and carbonic acid was only disengaged; if the putrefaction had continued for a longer time the sugar was no longer decomposed and the development of foul gases continued. Every ferment appears to have different phases of transformation, according to which it will produce a different separation of atoms in other compound bodies, to which subject Frémy has called attention. As regards the means of *arresting* or diminishing the *Zymomotoric power* of yeast, nothing can be added to Quevenne's observations; but it is worthy of being mentioned, that a strong solution of arsenious acid will not arrest or scarcely retard fermentation: no proof against the organic nature of yeast, for arsenious acid ought, according to the other theory of fermentation, to stop this process, as arsenic imparts its antiseptic properties to organic structures. In feculent putrefaction of yeast a decomposition of its membranes takes place, and infusoria with numerous infinitely minute molecules are formed as in the ultimate decomposition of all organic structure.

At the close of my examination of yeast, I received a copy of *Mulder's Physiological Chemistry*, in which he arrives at a similar composition of yeast to that I found by a very different process. Mulder is convinced of the cellular nature of yeast, but mentions, as the contents of the cells, a substance which on boiling with water is readily converted into a superoxide of proteine. He found the cellular membrane devoid of nitrogen, and consisting of

Carbon	45.01
Hydrogen	6.11
Oxygen	48.48

Whence he calculates a formula giving 44.92 per cent. of carbon. The difference in the description of the proteine is easily accounted for by the manner in which Mulder obtained it, for he extracted with acetic acid and precipitated with carbonate of ammonia; thus he found only 54.35 C., but 16 per cent. of N. in the process of transposition of elements in the fermentation of yeast. Mulder assumes a penetration of the proteine through the cellular membrane by endosmose, and his proteine is likewise characterized by a remarkable tendency to decomposition.—*Annalen der Chemie und Pharmacie*. *Band* li., *p.* 193.

NEW METHOD OF MAKING PROTO-IODIDE OF IRON, IN A STATE OF PURITY.

BY M. KOP.

It is known that the proto-iodide of iron, prepared in the usual way, cannot be obtained solid in a state of purity. The limpid and colourless solution first formed, acquires a portion of oxygen from the air, and a part of the iron is thus oxydized, while, at the same time, a portion of biniodide of iron is formed, so that the product consists of a mixture of iodide and biniodide of iron with peroxide of iron. If this mixture be dissolved in water, the solution will be of a yellowish-red colour, more or less deep, according to the quantity of biniodide, or even of free iodine present; the solution will also be turbid on account of the peroxide of iron held in suspension.

The author recommends the following method of preparing pure iodide of iron:—Triturate four parts of iodine with two parts of water in a large dish; then add, at once, one part of iron filings in a state of fine division, and continue the trituration. In a few moments there will be manifested a considerable elevation of temperature, together with the disengagement of the vapour of iodine. Sometimes, especially if the temperature of the atmosphere be low, the heat developed from the mixture is insufficient to cause the disengagement of iodine vapour; but in this case, it is only necessary slightly to heat the mixture, immediately after the addition of the iron filings. The mixture is at first liquid, but it soon becomes solid.

There exists, in the proto-iodide of iron thus prepared, a small quantity of iron, which may be easily separated by a filter, when the salt is used in solution, and the filtered liquor will then be colourless, and free from any mixture of binodide, or of free iodine.

This preparation may be easily administered in the form of pills, made with any proper excipient.—*Schmidt's Jahrbuecher*, and *Journal de Chimie Médicale*.

PREVENTION OF THE OXYDATION OF IRON FILINGS, INTENDED FOR PHARMACEUTICAL USE.

BY M. GIOVANNI RIGHINI.

It is well known to Pharmaceutists that it is very difficult to prevent the oxydation of iron filings; even inclosing them in stoppered bottles, perfectly fitted, is not sufficient. M. Righini has discovered that they may be preserved for any length of time, by reducing the filings to fine powder and mixing them with an equal quantity of well dried sugar. The mixture, which will be of a lead colour, may be kept in paper, provided it be preserved from moisture.——*Journal de Chimie Médicale*.

PHOSPHORUS PASTE FOR THE DESTRUCTION OF RATS AND MICE.

BY M. SIMON, OF BERLIN.

The Prussian government issued an ordonnance on the 27th of April, 1843, directing the following composition to be substituted for arsenic, for destroying rats and mice; enjoining the authorities of the different provinces to communicate, at the expiration of a year, the results of the trials made with it, with the view of framing a law on this subject.

The following is the formula for this paste, as published in the *Berliner Medicinische Zeitung*:—

Take of phosphorus 8 parts, liquify it in 180 parts of lukewarm water, pour the whole into a mortar, and add immediately 180 parts of rye meal; when cold, mix in 180 parts of butter melted, and 125 parts of sugar.

If the phosphorus is in a finely divided state, the ingredients may be all mixed at once, without melting them.

This mixture will retain its efficacy for many years, for the phosphorus is preserved by the butter, and only becomes oxydized on the surface.

Rats and mice eat this mixture with avidity; after which they swell out, and soon die.

M. Simon, who has employed this mixture for many years, with constant success, by placing it in places frequented by those animals. According to him, the phosphorus is less dangerous than arsenic, for supposing the mixture to be badly made, and the phosphorus imperfectly divided, the oxydation which would take place in a few days would render it nearly inactive; and it would be almost impossible to employ it for the intentional poisoning of human beings.—*Journal de Chimie Médicale.*

BLUE INK.

BY M. HORNUNG.

M. Hornung has given the following as the best formula for blue ink:—

Mix four parts of perchloride of iron in solution with 750 parts of water, then add four parts of cyanide of potassium dissolved in a little water; collect the precipitate formed, wash it with several additions of water, allow it to drain until it weighs about 200 parts; add to this one part of oxalic acid, and promote the solution of the cyanide by shaking the bottle containing the mixture.

The addition of gum and sugar is useless, and even appears to exercise a prejudicial effect on the beauty of the ink. It may be kept without any addition for a long time.—*Journal de Chimie Médicale.*

ISOCHROMIC VARNISH.

The following is the varnish with which the appearance of oil paintings is given to coloured engravings and lithographs:—

Mix one pint fifteen ounces imperial of oil of turpentine, seven and a half ounces of mastic in coarse powder, and four and a half ounces of powdered glass; expose the mixture for twenty-five days to the rays of the sun, shaking it from time to time; then add one pound, one ounce and a half avoirdupois of the best Venice turpentine, and after again exposing it to the action of the sun's rays for some days, let it be filtered.—*Dingler's Journal.*

[We doubt whether the addition of Venice turpentine is an advantage, especially as it is scarcely ever met with except as a manufactured article, consisting of resin and oil of turpentine. We believe the best varnish for paintings is made by dissolving gum mastic in rectified oil of turpentine.—Ed.]

SAPONINE AND GANTEINE FOR CLEANING KID GLOVES.

M. Duvignau has taken out a patent for a preparation intended for cleaning gloves, and called *saponine*, which, according to the patent is made as follows :—

Take of	Soap in Powder	250 parts
	[*]Chloruret of Potash (Eau de javelle)	165 “
	Solution of Ammonia	10 “
	Water	155 “

Make the whole into a paste, a small portion of which is to be rubbed over the glove with a small piece of flannel, until it is sufficiently cleaned.

M. Buhan has prepared and sold a compound which he calls *ganteine*, which consists of soap and essence of citron, made into a paste with water.

PREPARATION OF INSTANTANEOUS LIGHT MATCHES,

WITHOUT SULPHUR, AND WHICH IGNITE WITHOUT NOISE.

Boettcher has published the following formula for the preparation of chemical matches, which ignite without noise :—

Take of	Gum Arabic	16 parts
	Phosphorus	9 “
	Nitrate of Potash	14 “
	Manganese	16 “

M. S. A. so as to form a perfectly homogeneous mass.

More recently, this Chemist, being desirous of making a mass equally good, but at a lower price, fixed on the following formula :—

Take of	Phosphorus	4 parts
	Nitrate of Potash	10 “
	Carpenters' Glue	6 “
	Minium, or Red Ochre	5 “
	Smalt	2 “

The glue is cut and soaked in a little water for 24 hours ; it is then put into a porcelain mortar, previously heated, so as to cause its liquefaction. The phosphorus is then added, afterwards the nitrate of potash, and lastly, the minium and smalt, mixing the ingredients constantly with the pestle, until a perfectly homogeneous mixture is formed which may almost be drawn out in threads.

During this operation, the temperature must never be allowed to rise above 167° Far., to prevent the inflammation of the particles of phosphorus.

This paste may be applied to wood prepared for the purpose, or to amadou previously dried for eight or twelve hours.

Paper matches may be made, which will afford an agreeable odour on igniting, by wetting slips of paper on both sides with tincture of benzoin, and then applying a small quantity of the above composition to their extremities, by means of a small brush. On rubbing one of these on a rough surface, the mass inflames and ignites the paper without the intervention of a coating of sulphur.

Matches of wood may be made that will inflame without sulphur, by slightly carbonizing the ends of them, by placing them against a red hot plate of iron, and then dipping them into melted wax.

M. Diesel, of Ebersdorf, pupil of M. Wackenroder, has analysed an excellent inflammable mass, and found the following proportions of ingredients in 100 parts :—

Phosphorus	17 parts
Nitrate of Potash	38 “
Minium	24 “
Glue	21 “

Journal de Chimie Médicale.

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[*] Similar to the chloruret of soda of Labaraque, Beaufoy, and others.—Ed.

ON THE CHEMICAL PRINCIPLES INVOLVED IN THE ROTATION OF CROPS.

Professor Daubeny made some remarks on the chemical principles involved in the rotation of crops, stating the conclusions which he had deduced from a series of experiments carried on within the Botanic Garden at Oxford, and intended to ascertain the rate of diminution in the produce of several plots of ground that had been sown for ten years, either continuously with the same, or successively with different crops, in either case without the addition of manure throughout the course of the trials. He stated, that although, as might have been anticipated, a diminution in the latter years' produce took place both in the permanent and in the shifting crops, and a smaller average amount was obtained in the former than in the latter, yet that after the expiration of the whole period the ground still continued unexhausted; and that an analysis of it showed it still to contain sufficient of the phosphates to supply materials for nineteen crops of barley, sufficient of potass for fifteen, and sufficient of soda for forty-five. The actual diminution then of produce during the latter years he attributed to the circumstance of these ingredients not being in a soluble condition, it being found that from the soil so long drawn upon, water impregnated with carbonic acid took up much less of the above ingredients, than it did from the same that had not been so cropped, and but recently manured. The greater diminution in the permanent than in the shifting crop he attributed to the circumstance of the latter being supplied with a larger amount of organic matter, derived from the fallow crop intercalated, owing to which the plants would be more fully developed through the influence of the carbonic acid and ammonia, which would be imparted to it by the decomposition of the *humus*. He pointed out, how the mere introduction of healthy plants into a soil might aid in rendering the phosphates and alkaline salts, locked up within the latter, more speedily soluble, and hence inferred that a larger amount of these substances might be extracted, where the plants were stimulated into activity by the presence of decomposing organic matter. He also was led to inquire whether, in the event of a scantier supply of one of the alkalies or of the earths than was common, a plant would substitute *ad libitum* another which might be presented to it in greater abundance. To determine this, he obtained from Mr. Way, late assistant to Prof. Graham, an analysis of three samples of six different kinds of crop—*viz.* potatoes, barley, turnips, hemp, flax, and beans; one sample being that cultivated for ten successive years in the same ground without manure; the second from a similar plot which had grown different crops for the same period without manure; the third from a plot in a contiguous part of the garden which had been recently manured. From the results obtained, it would appear that the aggregate amount of *bases*, in the three samples, was about the same; but the proportion of these bases one to the other varied considerably, a circumstance at first sight appearing to confirm the theory of substitution. The author however conceives that this may be explained, by supposing a different degree of development of the several parts or proximate principles in the respective samples, as he finds a great discrepancy in the amount of phosphoric acid in gluten and in starch, and thinks it probable that the same diversity may extend to other of the principles contained in each plant. That potass is better adapted for the organization of a plant than soda, seems to follow from the circumstance, that whilst the soil usually contained an excess of soda, the plant always was most rich in potass. The author, therefore, in accordance with the views of Liebig, throws out as a conjecture, that the soda found in the ash may be that circulating through the vegetable tissue, and contained on the top, whilst the potass is actually assimilated, and constitutes a part of the vegetable tissue. The former, as Liebig supposes, may be useful in conveying carbonic acid to the plant, but cannot be substituted for potass, at least without injury to its healthy condition. It appears also, from the analyses referred to, that land plants have not the power of decomposing common salt, so that this substance cannot, as has been supposed, be serviceable to vegetation, by supplying it with alkali. We may also infer, that it does not follow, because a soil is benefited by manuring, that it is destitute of the ingredients which the manure supplies, since it may happen that these ingredients are present in the soil in an insoluble, and therefore not an available condition. Chemical and mechanical means may no doubt be effectual in bringing into a soluble condition the phosphates and alkaline salts thus locked up within the soil, but as this is brought about by Nature herself, we are counteracting her beneficial effects when we waste the products of these operations, ready prepared for our hands, as is done in suffering to run to waste the various excrementitious matters which are placed at our disposal. The analyses given may also show, from their great discrepancy with those of Sprengel, the importance of that investigation of the constituents of the ashes of plants, now about to be undertaken under the auspices of the Royal Agricultural Society. The author also conceived that the line of research which he had pursued might be useful as an illustration of that system of Scientific Book-keeping, which he had proposed at a former meeting of the Association, at once as an useful exercise to the agricultural student, and as a means of introducing greater precision into the conduct of our experiments in such subjects.—*Fifteenth Meeting of the British Association for the Advancement of Science.*

FIZEAU'S PROCESS OF ETCHING DAGUERREOTYPE PLATES

AND ITS APPLICATION TO OBJECTS OF NATURAL HISTORY.

BY MR. GOADBY.

In a Daguerréotype portrait, the black parts of the plate consist of silver, the white of mercury, and the intermediate tint of a mixture of the two, the degree of darkness or light depending upon the excess either of the silver or of the mercury. In converting a Daguerréotype into an engraved plate, it is necessary to etch away the dark parts and to leave the white untouched. This is done by immersing the plate in a fluid, consisting of dilute nitric acid, nitrous acid, chloride of sodium, and nitrate of potash. The nitric acid is so far diluted, that no decomposition can take place until the mixture is heated, when the chloride of sodium and nitrate of potash are decomposed, and chlorine and nitrous acid are evolved. These attack and remove the silver, or the *dark* portions of the plate, but have no effect upon the mercury, so that the *lights* of the picture, being the mercurialized portions of the plate, constitute the *etching* ground, and effectually defend such portions of the Daguerréotype from the influence of the corroding fluid. After a time, those portions of the plate that have been acted upon by the chlorine, &c. become covered with a protecting coat of the chloride of silver: this must be removed by dilute liquid ammonia, when the biting may be continued by a fresh supply of the mixed acid. Grease and foreign matter must be removed by repeated washings in dilute acid and alkali, and by boiling in caustic potash. These cleansing operations must be repeated after every biting, after washing out the chloride of silver by the ammonia. The plate being thus bitten, but in a slight degree, is to be inked after the ordinary manner of engravers, and allowed to dry; the surface of the plate is then to be thoroughly polished, the ink still remaining in the corroded portions of the plate. It is now to be gilded by the electrotype, those parts alone receiving the gold that have been previously polished. The ink is then to be dissolved out of the hollows by potash: the parts that are gilded now constitute the etching ground, instead of the mercury, and the biting may be henceforth continued by nitric acid, in the customary usage of engravers. The plate thus etched, generally requires to be finished by the hand of the engraver, who has the advantage of a *perfect*, although *faint* picture to work upon. The amount of labour which he must bestow will depend upon the goodness of the Daguerréotype, and the success of the etching. M. Claudet has fully established the successful application of this process to the purposes of illustrating Natural History, by copying from Nature and engraving several delicate and difficult dissections of the lower animals, particularly the nervous system of Aplysia and Tritonia (the latter much magnified), and the nutrimental organs *in situ* of a caterpillar. These preparations, together with the engravings of them, were handed round.

Dr. Carpenter stated, that a similar process had been employed for engraving microscopic objects, the discovery of which was due to Capt. Ibbetson. He exhibited some plates of blood-globules, and other microscopic objects, published by Dr. Donné, of Paris, which had been procured in this way.—*Meeting of the British Association.*

ON A NEW PROPERTY OF GASES.

BY PROFESSOR GRAHAM, F.R.S., &C.

After explaining the law which regulated the diffusion of gases through porous bodies, and stating the fact, that the lighter gases diffused themselves much more speedily than the more dense ones,—that their diffusion was equal to the square of their densities,—he proceeded to relate his experiments on the passage of gases into a vacuum. To this passage, the term *effusion* has been applied. The velocity of air being 1. the velocity of oxygen was found to be .9500 by experiment, and by calculation .9487. Carbonic acid being much heavier than air, gave the number .812. Carburetted hydrogen gave .1322 as the velocity of its effusion. Hydrogen gave as the velocity of effusion 3.613 by experiment, which was very nearly the amount given by theory. The interference of friction even of minute orifices, was then described, and shown to admit of easy correction. Some useful applications were mentioned; as in the manufacture of coal gas, where it is desirable to ascertain the quality, as well as the quantity of gas manufactured. As the gas will pass the orifice on its way to a vacuum, the quicker, the lighter it is, and the more slowly as it increases in density, and as the superior carburetted hydrogen is heaviest, it would be easy to construct an instrument to register this velocity, and thus mark at once the required quality and quantity of gas. It was also proposed that an instrument might be used in mines to detect the presence of light carburetted hydrogen (fire damp). The passage of gases under pressure through porous bodies was termed by Professor Graham *transpiration*. The mode adopted in experiment, was, to take a glass receiver, open at the top, which was closed with a plate of stucco. This was placed on an air pump, the air exhausted by the pump, and the velocity with which the air passed through the stucco being marked by the mercurial gauge of the pump. The transpiration of atmospheric air was found to be greater than that of oxygen. Carbonic acid is found to be more transpirable than oxygen—or even, under low pressure, than atmospheric air. The transpiration of hydrogen is one-third more rapid than that of oxygen. The applicability of this process of experimenting to the explanation of exosmose and endosmose action in the passage of fluids through porous bodies was pointed out.

Mr. Bain made some observations to the effect, that Professor Graham's researches went to explain many meteorological phenomena, but particularly the suspension in the atmosphere of masses of aqueous vapour, in the form of clouds.—*Meeting of the British Association.*

RECENT EXPERIMENTS ON OZONE,

BY PROFESSOR SCHÖNBEIN.

Professor Schönbein was first induced to undertake his researches from the obscurity which rested upon the phenomena of the odour produced during the galvanic decomposition of water, resembling the smell of an electrical machine, and during thunder storms. In pursuing these researches, the author was led to the discovery, that the smell was always developed at the positive pole; that it was capable of being preserved in closed bottles; that heat destroyed it, and that many of the metals had also the same power. Experiments were made with a view to discover some means of procuring ozone easily; and after the trial of a great many bodies, it was found that phosphorus was particularly suited for the purpose. If a piece of phosphorus is placed in a bottle of common air, when maintained in a moist state, it readily produces this peculiar principle, on which the electrical smell depends. Several experiments were shown, to illustrate the effects of ozone in bleaching litmus paper and paper coloured with indigo, or a solution of that substance. If powdered iron or silver are placed in vessels containing ozone, the smell is immediately removed, and the metals exhibit a kind of oxidation. Other bodies were named, as producing a similar result; and many chemical decompositions were found to arise from exposure to the action of this peculiar principle. Solution of iodide of potassium is rapidly decomposed, iodine being set free; this was shown by a mixture of this salt with starch, which, on being exposed to the action of ozone, turned blue by the formation of iodide of starch. Bromide of potassium was also decomposed by this principle, and bromine liberated. Salts of iron were shown to undergo the same changes. A number of organic bodies, both vegetable and animal, destroy the ozonous smell. If ozonized air be made to pass through a tube, and this tube gently heated, all the properties of ozone are destroyed. This was shown by experiment. By the inspiration of ozone, similar effects are produced on the lungs to those resulting from chlorine and bromine. A mouse was killed in five minutes, and the experimentalist himself was seriously affected by breathing an atmosphere charged with this odour. By electrolysis, gold or platina points are necessary for the developement of ozone. The electrical brush in all cases produces the same effects as those above described; all the decompositions can be produced, and the same smell is distinctly evident. In this case, as in the other, heat and some of the metals also destroy the odour. Endeavours have been made to procure ozone in an isolated state, but they have not been successful. Ozone, although at first supposed to be an elementary body, was afterwards considered as a compound of oxygen and hydrogen. The fact of heat destroying this peculiar odour at once, shows that this principle is produced from the elimination of an oxygen compound from the decomposition of water. This is quite in accordance with the views entertained by Mariniac, who has pursued the investigation with great industry, and who has published a memoir, in which his views are luminously set forth. The author of this report is of opinion that ozone will turn out to be a compound isomeric with the binoxide of water.* A theoretical view of the production of this body was then entered into. The ordinary action of phosphorus undergoing oxidation in the atmospheric air was explained, and the remarkable fact stated, that although phosphorus was luminous in moist air, it was not so in perfectly dry air. Ozone may now, therefore, although long regarded by Professor Schönbein as an elementary body, be looked upon as, in all probability, a tritoxide of hydrogen. Its bleaching properties are very remarkable, and it may possibly be of considerable practical utility.—*Meeting of the British Association.*

[* The above account was taken from the *Athenæum:* but Professor Schönbein informed us, that he considered ozone a binoxide of hydrogen, isomeric but not identical with the binoxide obtained by Thenard.—Ed. *Pharm. Journ.*]

TOXICOLOGY.

POISONING BY HYDROCYANIC ACID.

The following particulars are taken from a Report published by Mr. Nunneley (Surgeon) in the *Provincial Medical and Surgical Journal*, of a case which occurred at Leeds during the month of May. One of the peculiarities of the case was the length of time which elapsed between the swallowing of the poison and the fatal result. There was reason to believe, that after having taken the poison, the deceased rinsed the glass with water, and then ran up stairs, where he was found a few minutes afterwards, apparently insensible on the sofa. The smell of prussic acid being perceptible, Mr. Nunneley, who arrived in about ten minutes, dashed water over his face and chest, and sent for solution of ammonia and solution of chlorine, which were successively administered. Ammonia was also applied externally to the chest. He was roused by this treatment, and sat up. Gradually he sank again, his legs, arms, and chest were convulsed, the jaw fixed, eyes prominent and staring, pupils widely dilated (before death they became less so, but a few hours after death, the dilatation increased). The countenance was puffed up, and rather dark. There was foam about the mouth; he breathed slowly and convulsively, like violent sobbing. There was no loud shriek. The hands were partially contracted, and the nails of a dark lead colour. He gradually became weaker, and died in about three-quarters of an hour after having taken the poison.

At the *post-mortem* examination, the smell of the acid was very powerful, and was perceived before the body was opened. Mr. West, who undertook the chemical examination, found traces of hydrocyanic acid in the arterial blood, in the fluid in the ventricles of the brain, the ileum, and other parts of the body, besides the stomach, in which he detected equal to twenty-seven grains of an acid of 1.5 per cent. This was found to be the strength of the acid which was remaining in the bottle, and which had been sold as Scheele's acid. Mr. Nunneley in his report of the case animadverts, and not without reason, on the ignorance of the Chemist, who could not point out the difference between Scheele's acid, and that of the Pharmacopœia, and confessed that he always used Scheele's in dispensing. It happened, however, that the acid which he had sold as Scheele's, instead of being nearly three times the strength, was twenty-five per cent. weaker than that of the Pharmacopœia.

Mr. West points out a slight error which he has detected in works on toxicology, which represents the cyanide of silver as insoluble in cold nitric acid, but soluble in hot. Mr. West finds that it is soluble in both, the difference being in the degree of solubility, and this difference being greater or less according to the state of division of the precipitate. If precipitated from a weak solution, it is finely divided, and dissolves readily in cold as well as hot nitric acid. If precipitated from a strong solution, and in the form of thick flakes, cold nitric acid acts but little and very slowly on it, while it is dissolved directly by the application of heat. Mr. West also states that, twenty-three days after death, he found the smell of the acid powerful in what remained of the contents of the stomach, and obtained from it the usual reaction with nitrate of silver, as well as the Prussian blue precipitate. This is at variance with the usually received opinions respecting the rapid decomposition of hydrocyanic acid, and the supposed difficulty of detecting it some time after the death of the person poisoned.

DEATH FROM TINCTURE OF ACONITE.

The unfortunate decease of Dr. Male, of Birmingham, shows the necessity of caution in the administration of this very powerful remedy. The doctor had been suffering from rheumatism, and had taken the tincture of aconite* in doses of five drops twice a day, without observing any very marked effect.

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* We are not informed what was the strength of the tincture.—Ed.

On one occasion he took as much as ten drops. The following day he was seized with pains and cramp in his legs, spasmodic pains in the stomach. His head was confused, extremities cold; pulse 130, but feeble. He gradually became weaker, notwithstanding the stimulants and mild aperients which were administered to diminish the action of the poison, and on the following evening he was found by his medical attendants in a dying state, from which he did not rally, but expired about ten o'clock in the morning. It was supposed that the effect of the medicine had been cumulative, as the doctor had taken it regularly for several days, and but little, if any, effect was perceptible until after he had taken the last dose, which by itself could not have been sufficient to occasion death.

POISONING BY SAVIN (JUNIPERUS SABINA).

The *Medical Gazette* of August 8th, contains a detailed account of the death of an unmarried woman, aged 24, who was supposed to have taken savin for the purpose of procuring abortion, and died in consequence as well as the child. She had taken a lodging at Hampstead with a nurse who had engaged to attend her in her expected confinement. This event, however, occurred prematurely, and the symptoms, and some other circumstances, having created suspicion, an inquest was held on the bodies. The fact that savin had been taken was discovered by Mr. Alfred S. Taylor, who having in vain tested the contents of the stomach for other poisons, observed, on using a microscope, the peculiar structure of the savin leaf with the glands and characteristic fibres. The verdict of the jury was to the effect that deceased died from taking savin, but for what purpose it was taken they could not tell, and that the child died from natural causes.

Savin is one of those poisons which ought never to be sold without a written order from a medical man. It is not unfrequently applied for either in substance or in the form of tincture, by persons who are unacquainted with its medicinal properties, and merely have a vague notion that it produces abortion. When parties apply for it in this way, and give no satisfactory account of the purpose for which it is required, it is the duty of the Chemist to refuse to sell it, and also to state that it is a dangerous poison. Mr. Taylor stated in his evidence at the inquest, "Savin is often taken by ignorant persons to cause abortion: when it produces abortion it generally destroys the mother, and sometimes kills the woman without causing the expulsion of the child."

NOTICES OF BOOKS.

The Pharmaceutical Latin Grammar, *being an easy Introduction to Medical Latin, the London Pharmacopœia, and the perusal of Physicians' Prescriptions.* By Arnold James Cooley. *London: Groombridge and Sons, 5, Paternoster Row.* Small 8vo, pp. 132.

The design of this little book is identical with that of Leach's *Introduction to the London Pharmacopœia,* the third edition of which we noticed, vol. ii., p. 667. In both books the rules of grammar are illustrated by examples taken from the Pharmacopœia and Prescriptions, the idioms occurring in Medical Latin are explained, and a Vocabulary of Medical Terms is added. So great a similarity is observable between the two books that it might almost be supposed that the author of the *Pharmaceutical Latin Grammar* belonged to the Leach family.

Traité de l'Art de Formuler; *ou Notions de Pharmacologie appliqué à la Médecine*. Par le Docteur Mialhe, *Pharmacien, Professeur Agrégé à la Faculté de Médecine, Ex-Pharmacien en Chef de l'Hôpital St. Antoine. Paris: Fortin, Masson, & Cie., Place de l'Ecole de Médecine. Lyon: Savy Jeune.* Small 8vo, pp. 220.

The object of this work is to point out the various reactions of substances on each other, in reference to the combinations adopted in prescriptions, with remarks on the therapeutic action of remedies, illustrated and supported by researches and experiments. The work is calculated to assist the Prescriber, and at the same time contains much information which is valuable to the Chemist.

The Economy of Health; *with a Chemical Exposition of Air, Water, and other Circumstances affecting the Sanatory Condition of the City of York.* By W. White, Chemist, York. 8vo, pp. 27.

A useful popular pamphlet.

THE PATENT CARRARA WATER.

Among the novelties of the day, may be mentioned, the introduction of a beverage, one of the recommendations to which consists in its holding bicarbonate of lime in solution. It was formerly supposed that absolute purity was desirable, and distilled water was recommended on this account, especially to patients suffering from calculous disorders. It has, however, been for some time admitted, that a certain amount of calcareous matter is rather beneficial than otherwise, and the patentee of the Carrara Water argues on this assumption. Taking a chemical view of the subject, we should think lime preferable to soda as an alkali in cases of gout, but we leave medical men to discuss the merits of the question.

TO CORRESPONDENTS.

The Moth Powder Trick.—The method adopted for selling this powder is ingenious. A traveller calls and recommends it in strong terms, requesting permission to send half a dozen or a dozen packets on sale or return. The goods are sent, with an invoice, on the corner of which is written, "Sale or return three months." A day or two after the expiration of the three months, the traveller calls for the money. He is told that none of the powder is sold, and he may take it away. This he declines, as the goods were not returned within the three months, and in the course of the day a lawyer's letter is sent, demanding the immediate payment of the amount. Several of our Correspondents have been caught in this way, without having caught any moth with the powder.

J. C.—(1.) Calcined magnesia and Epsom salts when combined in mixtures sometimes solidify (see vol. iv., page 312).—(2.) The other prescription in which ʒj of bicarbonate of potash is ordered with oxym. scillæ ℥iv, is an unusual one, but by no means dangerous. An acetate of potash would be formed, which would act as a mild diuretic.—(3.) J. C. wants another formula for marking ink, without preparation.

"Philanthropos."—The notion of the electrical origin of "Fairy rings" is a very old one. The subject does not come within our province.

W. S.—To obviate the confusion in the nomenclature of the Pharmacopœia respecting the Aq. menthæ V. P. and P., it should be understood that aq. menthæ means aq. menthæ viridis, or mint water; aq. menthæ p., peppermint water; aq. menthæ pul., penny-royal water.

"Thunder."—A formula for a Storm Glass is published vol. ii., p. 777.

J. Adamson.—We are not aware of any Chemical difference between the two solutions mentioned.

"Equivalent."—*Cuff's Logometric Scale of Chemical Equivalents* is one of the best of the kind.

"An Apprentice."—In the cases alluded to, the weights of the atoms are given in the first column, and the proportions in one hundred parts in the second. The composition of hydrochloric acid is thus described:—

One equivalent of hydrogen............	1 or	2.7
One equivalent of chlorine	36 or	97.3
	37	100.0

Thus, as 37 parts of hydrochloric acid contain one of hydrogen, 100 parts will contain 2.7. In the other case alluded to—hydrocyanic acid, as 27 parts of the acid contain one of hydrogen, 100 parts will contain 3.7.

F.R. inquires the cause of diluted hydrocyanic acid acquiring a pale orange colour. [The spontaneous decomposition of hydrocyanic acid, especially when in a state of great purity, has been already noticed in this journal, (vol. ii., page 330), and we presume the effect noticed by our Correspondent, must be the commencement of such a change.]

R. R.—(1.) By the process of displacement, infusions may be made of any required strength, and the addition of a certain proportion of spirit, probably one-fifth, prevents their spoiling. We are not acquainted with any better mode of making concentrated infusions, a class of preparations which we never recommend for general use, although for travelling, or in cases of emergency, they may be a convenient substitute for the ordinary infusions.—(2.) We are not acquainted with any recent work on colours and dyeing.

L. M. N. inquires how he may become a good practical Chemist? [Enter as a practical pupil in the laboratory of the Pharmaceutical Society. See Notice inside the cover of this journal.]

"Amicus."—Extractum sarzæ liquidum is a preparation, the strength of which is arbitrary. We believe it is generally made in such proportions, that ʒij represent ℥iv of the decoction. It is sometimes sold exactly half the strength. We believe these two strengths are the most commonly adopted, and of the two, the strongest is generally preferred. When ordered in a prescription, the dose prescribed will generally denote which is intended. In case of doubt, it is easy to inquire.

"Ferrum" alludes to the confusion existing between the citrate and ammonio-citrate of iron, and inquires which ought to be used when the citrate is ordered. We can only repeat what we have said before, that we believe the neutral citrate is rarely if ever ordered intentionally. The ammonio-citrate having been unfortunately introduced under the name of a Citrate, the latter name is occasionally used when the former salt is intended. We can give no positive instructions as to what should be done in each case, but it should be the object of the dispenser to fulfil the intentions of the prescriber whenever these can be ascertained.

"Adolescens" (1.) should apply to the Secretary for his receipt.—(2.) A jet of oxygen may be ignited in an atmosphere of hydrogen.

W. H. P. (Plymouth).—(1.) Camphor being soluble in fixed oils and fats, increases the fluidity of mercurial ointment.—(2.) To detect the presence of resin in bees' wax, dissolve it out with alcohol.—(3.) We have seen a pocket microscope for botanical purposes, advertised by Mr. Abraham, 20, Lord Street, Liverpool, price £3 15*s*., or by post £3 17*s*. 6*d*.—(4.) We have seen no announcement of a new edition of *Pereira's Materia Medica*.

"Humanitas" suggests the publication of a caution respecting a young man who is in the habit of drinking large quantities of rectified sulphuric ether, and when under its influence becomes violent. His appearance is sometimes, but not always respectable, and he occasionally asks for as much as half a pint. We have seen a person of this description, and recognised the smell of ether as soon as he entered the shop. He asked for half an ounce in the same quantity of water, which he swallowed instantly, observing that he had a spasm. Humanitas mentions that a friend of his gave him half a pint of a solution of Epsom salts with a little ether in it. We cannot approve of this plan, for if the price of ether were charged, it would be unfair, and if not, the substitution would be detected by the low price: we can suggest no means of checking the bad habit, but refusing to sell ether to the young man at all. Such customers ought to be cautioned not to go near a gas light, as they are surrounded by an inflammable atmosphere.

"Japonica."—The London College has not published a new Pharmacopœia since 1836.

A. P. S. (Horncastle).—(1.) The names of candidates who pass the examinations will be published.—(2.) The examination in Botany is confined to ordinary medicinal plants.—(3.) Chemistry *versus* Chymistry. A.P.S. inquires why we adopt the former mode of spelling, when Johnson and Walker give the latter. The derivation generally given, is from the Greek word *κεω*, *to fuse*, *melt* or *burn*, or *κυω*, another mode of spelling the same word. Webster says, this derivation is a random guess, and that the word is derived from the Arabic KIMIA, "the occult art," for which reason he writes the word Chimistry. This is in accordance with the French, Spanish, Latin, Italian, and Portuguese orthography. The preponderance of custom in this country as well as in Germany, is in favour of the E, which at all events is quite as correct as the Y.

C. (Oxford).—(1.) What is the best work on Algebra? [*Bonnycastle's Algebra* was celebrated in our time. Probably it may have been superseded. We think any bookseller in Oxford would give the needful information, if not, try Cambridge.]—(2.) Fleming and Tibbins's is the best pronouncing French Dictionary.

"An Associate."—(1.) A new edition of *Davy's Agricultural Chemistry* has lately been published by his brother Dr. Davy.—(2.) *Phillips's Geology*.

"Tyro" inquires how to make Dr. Gregory's powder of the light pink colour adopted by some Chemists. [By keeping it a few years, the action of the magnesia on the rhubarb will produce the result so much desired by our Correspondent.]

"A Well-wisher to the Profession" complains, that while a provision exists in the Charter for the admission, without examination, of Chemists who were in business before the date of the Charter, this does not extend to Assistants and Apprentices. He considers this an injustice, and tantamount to an exclusion from the advantages of the Society. [The injustice consists in offering to aspiring young men the great benefit of an examination with a certificate of qualification, which when obtained will be found to be more advantageous than a certificate of membership obtained by purchase. We contend that the rising generation have no reason to complain of the exertions which are being made to raise their character, qualifications, and respectability. The examinations cannot be too soon universally adopted. The prospect of an examination is an inducement to study—the result of study is knowledge—knowledge is power—and power properly applied produces wealth.]

Advertisements to Mr. Churchill, Princes Street, Soho.

Other Communications to The Editor, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. IV.—OCTOBER 1st, 1845.

THE SCHOOL OF PHARMACY.

FOURTH SESSION.

When the School of Pharmacy was founded, four years ago, it was considered expedient to confine the courses of lectures, as well as the fees for attendance, within the narrowest possible limits. The object was, in the first instance, to excite in the minds of the Associates and Apprentices an interest in science, and a desire for improvement, and to encourage the attendance of lectures, without trespassing improperly on the hours of business.

While this object has been constantly kept in view up to the present time, the Council have not been unmindful of the ulterior purpose for which the School was designed, namely as a national establishment for the cultivation of Pharmacy, and the education of Chemists and Druggists. One of the difficulties they have had to contend against, was that of maintaining a middle course which should promote each of these objects without frustrating the other. It is obvious that if the instruction had been made too extended, and the terms too high, the Students would have been discouraged from attending, and the School would probably have been deserted On the other hand, it was necessary to guard against the other extreme of lowering the standard so much as to destroy the character of the School.

During the three sessions which are past, the arrangements for furnishing instruction in every branch of science connected with Pharmacy, have gradually progressed to a state of completion, and the institution at this time possesses the means of carrying out effectively all that was contemplated in its formation.

The courses of lectures have purposely been so arranged as not to compete with the corresponding courses in the medical schools. Such competition would have been injurious and undesirable. The school is not designed for medical students, but for students in Pharmacy, and the Council have endeavoured to adapt the course of study to the requirements of their own body without reference to any plan or regulations adopted in other establishments previously existing in this country.

In the appointment of professors, it has been their desire to select the highest authorities in the several departments, and we can scarcely hope at any period to be more fortunate in this respect than we are at the present time. In Materia Medica and Botany, Dr. Pereira and Dr. Thomson not only enjoy a distinguished reputation, but are indefatigable in the performance of their duties; and to their zeal and talents the School of Pharmacy is greatly indebted. Mr. Fownes, as a teacher of Chemistry, has given very general satisfaction, and enjoys a high rank in public estimation, especially in reference to his experience in organic chemistry and analytical research. Mr. Redwood, having been originally educated as a retail Chemist, and having embraced the profession in the capacity of a teacher of Pharmacy at the time of the formation of the Society, possesses the advantage of an intimate acquaintance with the requirements of his pupils, together with that scientific knowledge and aptitude for imparting information which have already made him popular as a teacher.

We have ventured thus to allude to the present position of the School and its professors, in order to make known to those Associates and Apprentices who reside within reach of the establishment, the advantage which they may derive from attending the lectures—an advantage which cannot with any degree of certainty be promised beyond the present session, however sanguine we may be in our hopes and expectations.

If it should happen that we should next year be unfortunately deprived of the assistance of any of our present teachers, it would be a source of regret to those young men who had by procrastination lost an opportunity not to be regained.

If it were needful to point out the benefit which has already been derived from attendance at the School of Pharmacy, we need only advert to the reports of the lectures at the examinations for prizes, published in our number for July (page 20). We may also notice the very creditable manner in which several of our Students have lately passed the Major Examination.

We cannot too strongly urge upon our brethren the importance of the School of Pharmacy to the general interests of our body at the present time. During the next session of parliament the question must be decided, whether the management of the education of Students in Pharmacy is to be intrusted to our body or not. A Bill is before the public, by which it is proposed to create a College of General Practitioners, who would educate and examine in Pharmacy as well as Medical Practice. No other Pharmaceutical institution is alluded to in the Bill, but clauses exist in it which would place Chemists and Druggists entirely under the power of the above-mentioned Pharmaceutical body. If our brethren should consider this a desirable and creditable position to be placed in, they need only remain inactive, and they will be quietly and effectually "put down." But if there be among us any spirit—any desire to maintain our ground and uphold the credit of our profession, we must unite firmly in self-defence, and assert our right to be considered the representatives of Pharmacy, and to regulate the education and examination of our future members. In so doing we must support our words by actions, and appeal to our School of Pharmacy to substantiate the justice of our demand.

ITINERANT QUACK DOCTORS.

There is in the Louvre, in Paris, a celebrated picture, by Teniers, representing a mountebank, or quack doctor, vociferating to a crowd of spectators, who are pressing forward to buy his wonderful pills, while an attendant is beating a drum to attract attention. These mountebanks were numerous on the continent a century ago, and are not yet extinct, although the changes in the continental medical laws have very much curtailed their number. It was their practice to travel from place to place with a mule and a moveable platform. When they stopped at any town, they erected the platform, and, by means of a drum or discordant trumpet played by an attendant, they attracted an audience, and puffed off their nostrums with great success.

Some of our readers are probably not aware, that a considerable number of a similar race of practitioners flourish at the present time in many of the market-towns in the north of England.

On market-days they are to be found at their stalls with a profusion of pills and infallible drops, worm-cakes, &c., creating no little sensation by the eloquence with which they address the multitude, and describe the wonderful cures they have made. Most of them are assisted by their wives, who dispense the medicines.

In Bradford, Preston, Leeds, York, Halifax, Huddersfield, and several other towns, as many as six or eight of these doctors frequent the markets, and carry on a very extensive traffic. Their chief practice is in the expulsion of worms, of which they have a variety of specimens in bottles on tables before them; but they also cure corns, and have universal medicines and pills of various kinds, and undertake to cure "all disorders both inward and outward."

As a specimen of the class, we may mention Mr. Wallace, of Bradford, who styles himself "the most celebrated Worm-Doctor," and addresses his audience in the following manner:—

"Now, then, don't forget that here is the celebrated Dr. Wallace, of Bradford, with his infallible worm-cakes. Now, then, all ages, from six weeks to 100 years (after 110 I don't undertake to cure). What do you think of that for a child of three years? (pointing to a tape-worm in a bottle)—that was a fourpenny cure. You must all of you have heard of the extraordinary worm that was expelled from Bartholomew Dodson, of George Street, Leeds. It was 120 measured yards long, and one inch in circumference. It was expelled by taking three doses of my worm-powders. I had it in a bottle on this table, and all the town came running in crowds to see it—and this made the other doctors very jealous; so that a boy, no doubt instigated by one of them, threw a stone at it and broke the bottle. However, I cared very little about that, for on the same day I sold seven pounds' worth of the worm-powders in consequence. For young children the worm-cakes is better, for you have only to say, 'Now, my little dear, here's a piece of gingerbread,' and down it goes in no time. But recollect it is not only worms that I cure; my universal medicine is good for indigestion, the wind, bilious complaints, bruises, sores, eruptions, bad legs, headache, and all kinds of inward complaints as well as outward. There's only two things it won't cure, and that's a black eye and a broken leg, and them I don't deal in. Here are pills for a woman's bad temper, four-and-sixpence a box; if it's of long standing, she may require two boxes; and if she ain't worth that, you'd better let her alone. (Have you any boxes for less than four-and-sixpence?) No! that's cheap, for you get all the humbug into the bargain. (What is the price of the humbug without the pills?) I don't sell it separate—the pills and the humbug go together. The worm-cakes are twopence each, and the powders the same. There they are, those figures tell you the age—give one night and morning."

Another of these doctors has taken a leaf out of Abernethy's book, he says—

"I'm not like those quack doctors all about the market. Whatever ails you, it don't matter, they always tell you it's the worms, and dose you with worm-cakes and worm-powders, just as if everybody's inside was cram-full of worms. It's ridiculous. I go deeper than that—I look at the cause; and what is the cause of nine disorders out of ten? Does any one feel uneasy in the body and limbs, pain in the head, heartburn, lowness of spirits, pain after eating, and suchlike, why the cause of it is the stomach, and if the stomach is foul, the humours is all locked up, and the blood is stagnated, and nothing is wanted but a few doses of these pills; here they are, threepence a box, containing upwards of fifty. Here are penny boxes, at leastways there's only one left—will you take it, marm? Thank you—Sold again—now, I have no more penny boxes, but I'll give you your choice, you shall either have a pen'orth of pills in a screw of paper, or a threepenny box for twopence. Will you take a box, sir? thank you—sold again—here's your change. (This is a penny short.) Oh! was you by when I said you should have a threepenny box for twopence. I beg your pardon, I didn't know you heard me say so; by all means, here is the other penny. Take two at night, or if your body is bound up, take two night and morning until they work you. I can expel worms as well as those quack doctors, but I can't expel them unless you have got 'em in your body. If you once try my pills I'm sure you'll recommend me. (Will you favour me with your card)? I've got no card. Those chaps that are not known give their cards. You may always find me here on market-days, and that's card enough for anybody."

There is another doctor who is famous for curing disorders of the eyes: his instructions are rather original.

"Now, my good woman, wet the little girl's eyes with this lotion, and then stand her in a draught, and let the cold wind blow upon 'em for a few minutes. Do this three times a day, and come to me again on Tuesday. I'm sorry I can't give you one of my printed bills, but they're all gone, I'm not one of those fellows that's ashamed of his name."

At another stall we are astonished with the virtues of an ointment:

"It's a certain cure for hair that falls off, or to make it grow again after it has fallen off, or for ringworm, scald-head, or the piles, or for sore legs, wounds, burns, bruises, and proud flesh. It will make the proud flesh come all right after one application, so that you may cure it with any simple ointment afterwards."

The inventor of this ointment is a young man apparently about two-and-twenty, but by his own account he must have had great experience. He tells a story about a dilapidated tape-worm which he has in a bottle: he says—

> "It was expelled from a gentleman who came to me one day and said, 'Now, doctor, I want some uncommon strong medicine;' and so, says I, 'You want it strong, do you?' 'Yes,' says he, 'it must be precious strong, or it won't do me no good, for all the doctors has had a try at me.' 'Well,' says I, 'you shall have it strong;' and I gave him some of the strongest I could mix up. Well, in the morning he comes to me and says, says he, 'That medicine what you gave me was something like medicine; it raked my inside I can tell you—but in the morning, when it operated, there was this here worm.' Now, ladies and gentlemen, you see the worm, it's broken all to pieces, for it was almost destroyed by the violence of the medicine; and these pieces what you see in the bottle was all that could be collected in a state of decency."

One of the doctors is rather severe against Chemists and Druggists. He wears a shabby dress like a labouring man, but we are informed that this is thrown aside when he leaves his stall, and that he drives about with his wife in a very respectable one-horse carriage. His wife attends him at his stall, and assists in compounding the medicine, or bottling the drops and mixtures. His leading argument is, that he is better acquainted with drugs and medical practice than the Doctors or Druggists, and that he can of course afford to sell his medicines for less than half the price, because he has no fine shop, heavy rent, and other useless expenses. Towards the close of the day, when he is anxious to sell off the remains of his stock, he is very energetic in his eloquence.

> "Has any one got wind on their stomach? let them take some of these drops, they will soon bring it off. Does any one feel pains in the body and limbs, and uneasiness after eating? let them take two of these pills every night. Does a child cry day and night? does it rub its nose? draw up its limbs and twist its little body about? depend upon it, the child has worms. Here are powders, a certain cure, only twopence each. For grown persons, there is nothing like terebinthine for worms; only you must mind how you take it, a small dose only acts on the kidneys: you must take one of these here doses to expel the worms. There's no quackery in this practice—I knows what I'm about. Them chaps what keep shops can't tell you what it is they sell. Ask any of 'em what is terebinthine and hydragrum rhei, and not one in ten on 'em can tell you. Why, any fool ought to know that terebinthine means turpentine, and in course hydragrum rhei means calomel—but them chaps don't know. I say, every one who keeps a shop ought to know something of the Pharmacopœia, and he should know what it is that he is a sellin'. There's no quackery about my practice, it won't do. I can explain the action of everything, and what it is."

Dr. Frith, "Medical Botanist, Water Caster, and Worm Destroyer," informs the public in a similar strain, that he "may be consulted with the greatest safety on every disease incident to the human frame."

T. Geldard, "Medical Botanist and Worm Destroyer," gives a long list of remedies, among which are "antebillous pills, carminatives for children who have weak stomachs andj bowles, pills for windy gravel and for stony gravel, cures for scurvy, cramp, heartburn, all kind of cancerous sores, &c. &c. He may be consulted in every stage of a certain disease, without confinement or restriction of dite;" and he says, that one box of his pills "has often cured patients that have been given over by all the faculty."

"T. G.'s worm lozenges for both young and old, they expel both tape and round worms, and small grub worms. Dose to be taken, a child one month old; one-eighth part of one, a year old; one-third, three years old, one; seven years old, one and a half; twelve years old, one at night and one in the morning; from sixteen to twenty years old, one at night and two in the morning. Give the dose every third morning."

One of these quacks, being asked if his pills contained opium, said—

"No, neither opium nor mercury, there's nothing but a vegetable substance, invented by myself. I give opium sometimes. I have it here, and if you doubt my word there it is, in that bottle. (That smells more like aniseed). Well, and there's aniseed in it—I make no mystery of that. When the doctors takes a guinea out of your pockets, they makes a mystery about it, it's natural they should. But why should I make a mystery, when I cure you for twopence—it ain't worth it."

The following is a sketch from life, of a dialogue between a herbalist and a young woman:—

"Have you got any savin?"—"I'm sorry to say there is not a bunch left, and I know there's none in the market, for I've been trying to get some."—"Can't you tell me where I can get it, I want it very particular?" "How long is it ago?"—"About twelve weeks."—"Oh! you're all in good time; come to me on Tuesday, and I shall have plenty."

Mr. Brown, of Leeds, states in his hand-bill, that—

"After ten years' practice with a brother who has travelled upwards of forty years' in the four quarters of the globe, he stands every Tuesday and Saturday in the Free Market, Leeds (please to observe the sign with the name painted on); and Bradford, every Thursday, at the bottom of the Market; and may be consulted at his residence, every Monday, Wednesday, Friday, and Sunday, where he gives advice gratis."

He gives a list of cures which he has performed with his black pills, antiscorbutic drops, invaluable ointment, &c., with a list of terrible complaints which he undertakes to cure without fail, concluding his statement with the words "Caution! Beware of impostors."

The above specimens will enable our readers to form some idea of the qualifications of the practitioners, and the subject of Medical Reform being before the public, we have been rather more minute in the description than we should otherwise have thought necessary. In case it should be supposed that the account is highly coloured or exaggerated, we may observe that, on the contrary, it is an abridged statement of what was witnessed in one of the markets alluded to during the last month.

We are informed that one of these itinerant practitioners has recently retired with a fortune. He was a few years ago in great distress, and applied to a Chemist for a few pills to sell. With these he commenced practice, and has subsequently saved upwards of six thousand pounds. In the meantime the Chemist who supplied him with his medicines has failed.

It is probable that the individual above alluded to had a peculiar genius for quackery, and it must not be supposed that all are equally successful; but there can be no doubt of the fact that this kind of practice is carried on to a great extent among a class of patients who are at the mercy of any pretenders to medical skill who can tell a plausible story.

A correspondent in Manchester tells us that, within a few doors of his shop, an itinerant quack is in the habit of selling pills in the street. He is by trade a hawker of blacking, and travels about with a donkey. He recommends his family pills for a variety of complaints, and states, by way of puff, that they are prepared by a respectable Chemist.

We believe the fame of these practitioners extends very little beyond the localities in which they flourish. They have never been interfered with by the Apothecaries' Company, and indeed, it might appear cowardly, or at all events *infra dignitatem*, to prosecute men whose average fee is about twopence. They can scarcely be considered the rivals of medical men, as the field which they occupy is only suited to persons like themselves. It is probably on this account that they have escaped notice, while the most vigorous efforts have been used to restrain quacks of a higher order, Chemists and Druggists, and all other persons who tread on the heels of regular Medical Practitioners.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

ABSTRACT OF A SECOND LECTURE ON THE NATURE AND PHYSICAL HISTORY OF GLASS,

And on its Applications in Pharmacy and Practical Chemistry.

BY E. W. BRAYLEY, JUN., F.L S, F.G.S., A. INST. C. E.,
Member of the Chemical Society of London; Corresponding Member of the Philosophical Society of Basle, &c.;
Lecturer on Mineralogy applied to the Arts, &c.

[*Delivered July* 23, 1845 (*a*)].

The subject of the real chemical nature of glass, and of its consequent hygrometric properties, and relations to chemical agents in general, being resumed from the first lecture, was treated in the following manner:—The powerful attraction for water, which renders every kind of glass ordinarily manufactured, even when in its most perfect state, a good conductor of electricity, under common circumstances, by forming a film of moisture on its surface, and thus renders also electrical experiments so difficult and so uncertain, especially in some conditions of the weather, was referred, after Professor Faraday, to what he has called "the half-combined and hygrometric state of the alkali," entering into its composition. In illustration of this point, the experiments of Mr. Griffith (now Lecturer on Chemistry in the Medical School of St. Bartholomew's Hospital) on the action of water on glass, were recited and some of them repeated. It was thus shown, that water which had been boiled upon either finely or coarsely pulverized flint glass, or upon finely-pulverized green-bottle glass, had become alkaline, reddening turmeric paper; and that the same effect was produced by moistening finely-pulverized flint glass placed on turmeric paper. Every kind of glass employed in Pharmacy and Chemistry, and in the Arts both ancient and modern, is subject to this solvent action of water(*b*); but the most perfectly vitreous form of volcanic glass, called Obsidian, as Mr. Griffith has shown, is not acted upon by that fluid, indicating that its alkali is in a state of more perfect combination than that of the artificial glasses. The experiments instituted by

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(*a*) An Abstract of the First Lecture, delivered on the 25th of June, will be found in the last number but one of this Journal, p. 54.

(*b*) If we may judge from a single experiment by Mr. Griffith on green-bottle glass in the form of Reaumur's porcelain, glass in the crystalline state is as readily acted upon by water as when in its vitreous form.

the late Dr. Turner, in which by the continued action of water, and of high-pressure steam, the alkali was extracted from plate and crown glass, and even their silica dissolved and then re-deposited, were also recited and illustrated (*c*).

The action of acids upon glass was then noticed—that of the hydro-fluoric, phosphoric, and muriatic acids (*d*) being particularized, together with the ambiguity stated to have arisen in chemical analysis, from the action of phosphoric acid in corroding glass being mistaken for that of hydro-fluoric acid, the presence of which, it is alleged, has thus sometimes been erroneously asserted (*e*). The action of the caustic fixed alkalies upon glass having been alluded to, the consideration of the immediate relations of that substance to chemical agents was concluded by some illustrations of the action upon it of ammonia and its salts. The gradual decomposition to which, as is well known, glass of all kinds is liable in stables and other localities in which ammonia is disengaged was referred to, and also an observation recorded by Mr. Griffith, that flint-glass bottles, in which carbonate of ammonia is kept, gradually become more brittle, and very liable to fracture (*f*). The experiments of Marchand and other German chemists on the action upon glass of sulphate of ammonia, and of a mixture of

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(*c*) Mr. Mallet's experiments on the action of a heat of 212° Fahr. when long continued, on inorganic and organic substances, made by desire of the British Association for the Advancement of Science, were greatly retarded by the extreme facility with which almost every kind of glass was found to decompose, under the continued action of boiling water. None was found to answer the purpose but the finest Bohemian glass (which was objectionable in point of expense) and green-bottle glass; the latter imperfectly.

(*d*) Glass retorts used for the distillation of muriatic acid are occasionally corroded; and Mr. Griffith found that while the potash of flint-glass was readily extracted from it by dilute muriatic acid, the solution obtained did not contain lead, while upon diffusing the finely-pulverized glass through water, the presence of that metal was immediately shown by sulphuretted hydrogen. It was remarked in the lecture, that the former result may perhaps be regarded as indicating the separate existence in the glass of the silicates of potash and lead, that of potash appearing to be attacked by the acid, while that of lead was unacted upon.

(*e*) This appears to have happened in certain experiments made by several continental Chemists, but it is an indication of the inferior quality of the glass employed, and is one of many results from which it may be inferred that glass, of whatever kind, manufactured upon the Continent, is a less perfect product than the same kind of glass as manufactured in England. On the other hand, there are some varieties of glass manufactured on the Continent, as the tube-glass of Bohemia for example, which are better adapted for some purposes than any made in this country; in which, in fact, no exactly corresponding kinds are produced.

Dr. Daubeny found that good English crown glass was scarcely, if at all acted upon by the vapour of phosphoric acid.

(*f*) A similar effect has been observed to take place with green-glass bottles in which carbonate of ammonia has been contained for some time.

the nitrate and muriate of that alkali were noticed, and illustrated by the exhibition of the results which had been obtained on their repetition in the laboratory of the Society, and in that of the London Institution. In these, Florence flasks, which are devoid of lead, were not attacked, either by the sulphate or by the mixture of nitrate and muriate, heated in them to 600° Fahr., while the latter corroded common flint-glass retorts. But the sulphate did not appear to act even on this kind of glass. It was inferred, therefore, that certain kinds of glass manufactured upon the continent, being subject to the action of this salt, a liability to it had been erroneously attributed to glass in general. (*g*)

As it formed part of the object of these lectures to present to the members and students of the PHARMACEUTICAL SOCIETY a *conspectus*, as it were, of the actual state of science on the subject, the following opinions were cited of three eminent Chemists, taking distinct walks in the science, and accustomed to view its objects under very different points of view. Professor Graham's opinion had been adverted to in the first lecture (p. 55).

FARADAY.—"Glass may be considered rather as a solution of different substances one in another, than as a strong chemical compound; and it owes its power of resisting agents generally to its perfectly compact state, and the existence of an insoluble and unchangeable film of silica, or highly silicated matter upon its surface."

JOHNSTON.—"It is doubtful how far any specimens of glass used in the arts may be considered as definite chemical compounds." (*h*)

KANE.—"It is difficult to trace any definite relation between the acid and bases in these glasses [the different kinds of common glass]; indeed we cannot look upon the different silicates as being really combined with each other; they are rather in a state of intimate mechanical mixture; hence, if the glass be kept soft, but not liquid, for a considerable time, the silicates gradually separate; the less fusible crystallizing, and rendering the glass opaque white." (*i*)

(*g*) A slightly decomposing action, or at least the production of a permanent stain, on flint-glass lamp-chimneys, from the action of gas-flame, has also been attributed to some ammoniacal compound evolved in the burning gas. The difference between English and foreign glass is noticed in a previous note.

(*h*) Professor Johnston, in his Report on the present state of our knowledge in regard to dimorphous bodies (*Seventh Meeting of British Association*, 1837), observes also, that glass has some claim to be added to the list of those substances which are known to exist in two states physically different, but of which the crystalline forms in both states have not been determined—on account of the difference in its properties when annealed and when suddenly cooled; but he appears to have overlooked the proper crystalline state of glass altogether, and the difference between that and the true vitreous state. This branch of the subject appears to be as complicated as it is interesting.

(*i*) A definite relation, however, has been traced by other Chemists between the acid and bases in glass. Indeed, this is a distinct question from that of the state in which the different silicates may exist in it. As intimated in

The manufacture and properties of *plate glass* were now entered upon, because, in the opinion of the lecturer, some of the latter were particularly illustrative of the true physical nature of glass in general, in its ordinary or vitreous state. The process by which this kind of glass is produced was described, chiefly after the manner in which it is carried on in the works of the Thames Plate Glass Company.

Plate glass consists, essentially, of silica, alkali (chiefly soda), and of lime. The first is employed in the form of Lynn sand. The alkali is manufactured in the way formerly pursued in the plate-glass works at Ravenhead, near St. Helen's, in Lancashire, by the mutual action of common salt and the finest American pearlash, the results of which are carbonate of soda and chloride of potassium, the greater part of the latter salt being separated from the carbonate of soda by crystallization. Nitrate of soda and arsenious acid are also used in smaller quantities. These materials are fused together, with a quantity of *callet*, or broken glass of the same kind, the resulting vitreous compound broken into small pieces, and the impurities which may be left by the imperfect combination of part of the materials carefully picked out.

A remarkable circumstance observable in the manufacture of plate glass, as well as in that of other kinds, is the impracticability of producing perfect glass by the simple fusion of the materials containing its elements, the presence and action of a similar compound previously manufactured being requisite. This is supplied by the callet just mentioned, or sometimes by a quantity of rough glass manufactured for the purpose.

The pure and perfect glass from which the imperfect portions have been separated, is remelted, and cast into plates, being poured out upon an iron table, heated by furnaces below, an iron roller being passed over the surface of the solidifying glass, and the thickness of the plates being regulated by rails of the same metal, upon which that roller is made to revolve (*k*).

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the abstract of the first lecture (p. 56), the characters and process of formation of Reaumur's porcelain, when strictly examined, are opposed to the notion of that process consisting in the separate crystallization of the various simple silicates which make up the glass, but indicate, on the contrary, their crystallization, in union, into one compound silicate, being the crystallized form of the particular kind of glass which may be under experiment.

(*k*) The upper surface of the plates thus formed, has a remarkable fluted aspect, which, in a work describing the manufacture, has been erroneously described as a cast of the surface of the roller. The markings unquestionably arise from the process of rolling, but the roller is a perfectly smooth cylinder. The real cause of this peculiarity of surface must depend on the nature of solidifying glass, and would form an interesting subject of physical inquiry.

The plate glass of the works at St. Gobain, near Paris, contains, according to Berthier, silica 73.5, soda 17, lime 6, some alumina, as usual in the French glasses, arising, probably from the silica being introduced in a less pure form than in England, and a minute proportion of oxide of iron.

The plate glass produced in the works of the Thames Company is remarkably free from colour, it has no tinge of violet or purple, caused by oxide of manganese, which is so frequently developed by the action of the sun in the plate glass of other manufactures; the amount of green is also very trifling, notwithstanding that a portion of oxide of iron is necessarily introduced as impurity in some of its materials.

Mr. Brayley stated his opinion, that there was an additional cause for the freedom from colour of plate-glass, the alkali for which was prepared in the manner that had been described. Dr. Faraday and M. Berthier, from their own experiments respectively, and manufacturers, from their general experience, had concurred in bearing testimony to the fact, that it is almost impossible to produce soda glass that does not exhibit and retain a certain amount either of a green or a blue colour. Now, as the soda manufactured by most of the ordinary processes, retains a small proportion of sulphur, Mr. Brayley was disposed to refer the colour of the glass into which it entered to the production of *ultramarine*, by the union of some combination of the sulphur with sodium, in the presence of the silica in the glass, according to the known composition of natural ultramarine prepared from lazulite, and to what has been observed in the artificial production of that pigment. Alkali prepared by the double decomposition of common salt and pearlash, is almost, if not entirely, devoid of sulphur; and hence, agreeably to this view of the subject, the almost entire freedom from a green or blue tinge of the glass which is manufactured by its means.

The foregoing details were illustrated by the exhibition of specimens of plate-glass in the successive stages of the process of manufacture, as conducted by the Thames Plate Glass Company, as well as of the perfect article, as produced in their works and in other establishments.

The circumstances in the history of plate glass considered to be illustrative of the nature of that substance in general, were now stated.

Dr. Faraday, it had been seen, had regarded glass "as a solution of different substances one in another," and had mainly attributed its power of resisting agents generally, "to its perfectly compact state, and the existence of an insoluble and unchangeable film of silica or highly silicated matter upon its surface." Now in the process of successive grinding, smoothing, and polishing plate glass so as to adapt it for windows or mirrors, this highly silicated film, Mr. Brayley observed, appears not unfrequently to be removed, so as to expose interior portions of the glass which are less highly silicated, and in which, therefore, the alkali is more liable to the action of water or other chemical agents, and which, also, are often comparatively soft and yielding. Hence this description of glass, when polished, often undergoes superficial changes, greatly interfering with its useful applications. A peculiar kind of corrosion, with the appearance of minute vegetations or crystallizations, spreads over the glass, whether as used in windows, in looking-glasses, or in telescopes, sometimes to so great an extent as to render it opake. Mr. Dollond informed Dr. Faraday that although much injury is experienced by opticians from the tarnish often occurring on polished flint-glass lenses (produced by the action of sulphuretted hydrogen or vapours on the oxide of lead in the glass, having been first condensed by the film of moisture attracted by the alkali), yet plate glass, for the reason here assigned, had, during his long experience, proved most injurious(*l*). But plate glass is also liable to another source of injury as an article of commerce. The polished plates are sometimes rendered useless, or at least greatly injured, by having the forms and surfaces of straw and other packing materials impressed upon them (portions of straw, &c., sometimes permanently adhering to the glass), in consequence of the soft nature of the substance exposed by the polishing; and a still more remarkable phenomenon is also in part attributable to the same cause, namely, the incorporation into one mass of two or more plates, the polished surfaces of which have been placed in close contact with each other. This happens occasionally when the plates are placed side by side in warehouses, or when they are packed for exportation, the polished sides being placed close together, furnishing extensive mutual surfaces of contact, the entire area of one plate being in contact with the entire area of the contiguous one. When left for a considerable time under these circumstances, two, three, or four, or even a greater number of plates become converted into one block of glass, which it is impossible to separate into the original plates without fracturing them. In some specimens which the lecturer had examined, the surface of one plate had incorporated with it portions of another, the surfaces of fracture of which were alone exposed, its substance having been torn through in the effort to separate the united plates by mechanical force. These were of English plate glass, and

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(*l*) In Dr. Turner's experiments, cited near the commencement of the lecture, plate glass was found to have been much more decomposed than crown glass by the action of high-pressure steam, but this was probably due to the larger proportion of alkali contained in it.

M. Pouillet has described similar specimens from the French works at St. Gobain.

This phenomenon is strongly confirmatory of Dr. Faraday's view of the nature of glass. It can only be consistently explained by referring it to the homogeneous attraction of the molecules of one plate for those of the contiguous one, the evenness of the two polished surfaces not only allowing them to be brought within a very minute distance of one another, but the hard and compact siliceous film which previously bound together the molecules of each plate, having been removed by the polishing, and the actual surfaces of contact being those of portions of the glass, the chemical nature and condition of which are such as readily to admit of their rapid mutual action and union into one mass (*m*).

The resumed inquiry into the philosophy of the subject was terminated by a notice of the researches of M. Ch. Deville on the comparative density of certain rocks and minerals in the crystallized and in the vitreous forms, which had been made public since the delivery of the first lecture. These establish the fact that felspar, labradorite, pyroxene, peridote, and other natural silicates, whether of alkalies or of earths, and oxide of iron, are all of higher specific gravity in the crystalline state than when fused into glass. And this is the case not only with these comparatively simple combinations of silicic acid, but also (as the experiments of M. Deville, in conjunction with former researches of M. Gustav Bischoff, have shown) with the more compound silicates, constituting stony and glassy lavas, basalt, and granite, and whether their vitreous forms exist in nature, or are produced by artificial fusion. These facts, it was observed by the lecturer, are in perfect harmony with the view originally taken by Mr. Gregory Watt, and subsequently verified by Professor Graham, as noticed in the first lecture, that heat is evolved on the passage of bodies from the vitreous to the crystalline state; M. Deville having shown that the latter is a more

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(*m*) This phenomenon appears to have been first recorded in science by M. Pouillet in his *Elements of Physics*, and was cited from that work by Sir Henry T. De la Bèche in his *Researches in Theoretical Geology*, published in 1834. The English specimens described in the lecture were met with in the Museum of the Athenæum at Plymouth in the following year. It is applied by Sir Henry to illustrate the consolidation of sand-stones, but considering the peculiar nature of glass, and its state of very unstable equilibrium, it may be doubted whether the nature of its adhesion really throws any light on that subject, except indeed so far as to show generally that attraction is being exerted and consolidation effected where no obvious forces are in action. But the consolidation of mortars, to explain which it has also been applied, is probably a very similar phenomenon, for the molecular state of the interior portions of the plate glass may be conceived strongly to resemble that of *set mortar*.

dense state of matter of the former, and the heat being almost invariably evolved when bodies pass from a rarer to a denser state, what is termed their *specific heat* being diminished.

The composition, as ascertained by analysis, of various descriptions of foreign glass, Italian, German, and French, was then stated, in addition to the particulars of a similar nature given in the former lecture. Among these was an ancient plate glass from Venice, analyzed by Berthier, containing silica 68.6, potash 6.9, soda 8.1, and lime 11, with minute proportions of magnesia, alumina, and oxide of iron. This is preferred by the French opticians to their own glass of St. Gobain, being less hygrometric. It is also untinged either with blue or green, having merely a slight smoky hue. A Bohemian glass closely resembling that which the chemists of Liebig's school assert to be preferable to those of almost every other kind, for the tubes employed in organic analysis, is composed, according to Berthier, of silica 71.7, potash 12.7, soda 2.5, lime 10.3, with minute proportions of alumina and the oxides of iron and manganese. A variety of French tube glass consists, according to the same chemist, of silica 69.2, potash 15.8, soda 3, lime 7.6, with small quantities of magnesia and alumina. The varieties of French green-bottle glass analysed by Dumas, one of them from Sèvres, containing nearly 30 per cent. of lime, with about 6 of alkali, and not more than from 46 to 54 of silica, must, it would seem, be liable to be corroded by acid liquors.

Some remarks were here introduced on the importance of the recent abolition of the Excise duties on glass, in reference especially to the manufacture of genuine and perfect green-bottle glass for chemical and philosophical purposes. Being stronger, harder, and much less fusible than other kinds of ordinary glass, it is very useful for tubes and small retorts; and being less hygrometric, it is better adapted for electrical apparatus, as was observed long ago by Dr. Priestley.

The history, properties, and composition of Faraday's heavy optical glasses, not containing alkali, but consisting severally of borate of lead, two varieties of silicated borate of lead, and silicated tri-borate of lead, were also briefly noticed, their high specific gravity (4.2, 5.44, 6.40, while that of the best flint glass used for lenses is only 3.616), optical characters, and perfect insulating power for electricity, being pointed out.

A few observations on the relation of glass to radiant forces in general, including the transcalescence or diathermancy of the different kinds known in the arts, concluded the lecture, some of the results obtained by M. Melloni on the latter subject being recited. In his experiments, of the rays of heat proceeding from an Argand lamp, Guinand's flint glass for telescopes allowed 67 per cent. to pass through it, absorbing the remaining 33; English and French flint glass allowed 64 or 65 per cent. to pass; plate-glass about 60; French crown glass (probably manufactured for optical purposes) 58; French window glass from 50 to 54, and English crown glass 49 per cent.

ORIGINAL AND EXTRACTED ARTICLES.

EXPERIMENTS AND OBSERVATIONS UPON THE DAMAGED STATE OF THE POTATO-CROP,

Now unhappily so prevalent in many parts of England, France, Belgium, &c.

BY ANDREW URE, M.D., F.R.S., &C.

In a recent visit to Weald Hall, in Essex, the residence of that distinguished agriculturist, C. T. Tower, Esq., samples of potatoes which had undergone different degrees of decomposition, instead of the usual ripening process in autumn, were put into my hands. The soft pulpy portions of the potatoes in which the organic structure was entirely destroyed, gave an alkaline reaction with pink litmus paper, and afforded ammonia by distillation at the heat of a liquid bath. When these portions were moistened with iodine water, they became very faintly blue, and that only for a short time. Sound potatoes, on the other hand, exhibit a very marked acid reaction with blue litmus paper, owing to the malic, tartaric, and citric acids which have been discovered in them by different Chemists, and they continue to possess the same acidity when boiled into a soft mash. In the process of complete decomposition these acids seem to be in a great measure destroyed, or to be supersaturated by the ammonia generated during the putrefactive fermentation of the azotized constituents of the potato.

The damaged potatoes which are not pulpy, but still pretty firm and only marked with brown streaks and spots, become very waxy when boiled, with an unpleasant taste and odour; they are still acidulous, and become blue with iodine water, but of a tint neither so deep, so uniform, nor so durable as slices of sound potato do. The potatoes thus damaged afford by grating down and elutriation through a searce, with much water and subsidence, a slightly coloured starch, of which the darker portion is slimy and remains on the top of the deposit. This brown slime may be washed away in a great measure by skillful manipulation. When the starch is then mixed with water, and left to itself in a warm place, with occasional stirring for a few days, a little vinegar is formed, which dissolves out much of the remaining impurity, and leaves a tolerably white, and quite wholesome fecula. 100 parts of these stained potatoes lose from

77 to 78 per cent. by being dried in a gentle steam heat, whereas 100 parts of sound potatoes lose only 75 parts upon an average.

It is to be regretted that the manufacture of fecula from potatoes, has been so little cultivated in this kingdom; for in an unpropitious season like the present, the calamity might have been considerably abated by working up all the damaged tubers without delay into starch, dextrine, &c.

In most of the fields where the potato-crop has suffered, the injury is not general, but exhibits many apparently anomalous exceptions; the roots of a portion of one row being sound, while those of a contiguous one in the same circumstances are diseased. I am hence led to seek for some co-operating cause of the phenomenon, besides the defect of sunshine and excess of moisture, to which it has been ascribed; and there seems to be no cause more probable than electricity, which has been unusually active in the atmosphere all this season. This power is characterized by the capricious nature of its ravages. It is a pity that so little attention has hitherto been bestowed upon the influence of this all-pervading agent in vegetation. It would be easy to erect upon lofty poplar and other hedge-row trees, copper conducting rods, and thereby to lead the electricity along the water-drain courses of a field. The plants on a piece of ground placed in this predicament, could hardly suffer injury from atmospherical electricity. The agency of electricity in vegetation should also be tried on an extensive scale, by keeping cast-iron flower-pots permanently electrified, some negatively and others positively, by means of a constant voltaic battery. In the northern parts of this island and of Europe, which are less subject to electrical meteors, the potato disease was never produced by the gloomy wet weather to which these countries are very liable. The damaged potatoes after being boiled in abundance of water and well drained, have been found to fatten pigs very well, and to cause no indisposition in these animals.

13, *Charlotte Street, Bedford Square,*
September 20*th*, 1845.

THE POTATO-BLIGHT.

Much excitement and alarm have recently prevailed in consequence of the discovery that the potatoes in many districts have been attacked by a disease which renders them unfit for use as food. So extensive is the mischief resulting from this disease, that in many places whole crops have been found to be hardly worth the digging. The disease has already extended through many counties in the south, and some in the north of England. It has spread through Germany, Holland, and Belgium, in some of which countries dysentery, cholera, and other forms of disease are said to have been brought on by the use of the diseased potatoes. At first there were no accounts of the appearance of the disease in Ireland; but it is now said to have unequivocally appeared there, and it is impossible to say to what extent it may yet go. The disease seems first to attack the haulm of the plant; and on reaching the tuber, its injurious effects are principally confined to the non-amylaceous part, so that it has been recommended at once to separate the starch from the diseased tubers. The starch so prepared has been found to be perfectly sound and good. There are at present many speculations as to the cause and nature of this disease; and many investigations are in progress, with the view of determining these points, but nothing satisfactory has yet been made out. We shall probably advert to the subject in a subsequent number; meanwhile we subjoin the following statement which has been published by practical men:—

THE POTATO-CROP.

At a meeting of the Hadleigh Farmers' Club on Friday, Sept. 13th, the lamentable failure of the potato-crop formed the principal subject of discussion. In the hope of allaying the alarm which prevails in the neighbourhood respecting the use of potatoes that have become partially injured, and also of suggesting a method by which a large amount of wholesome food may be saved from such as would otherwise be thrown away, or given to pigs, it was resolved that a statement should be circulated, expressing the opinions of the club on these subjects:—

I. It appears to be certain, that the failure is entirely owing to the season having been unsuited to fully perfecting the tubers of most of the varieties of the potato.

II. Wherever the leaves and stems are dead, it is advisable to dig up the crop as speedily as possible; and to select the best tubers (to be kept apart from the rest) for seed potatoes. It is probable there will be a great scarcity when sets will be wanted, unless precautions are pretty generally adopted for saving the best.

III. The potatoes thus separated for sets, should be preserved with more care than usual. They should be kept as dry as possible, and examined at intervals, to see whether any of them are beginning to decay, and all such should be immediately removed.

IV. The spotted and decaying potatoes should be carefully picked out from among such as are to be preserved in store for winter and spring use.

V. As there is great danger from a single decaying potato being left in contact with others in the same heap, lest it should tend to rot all around it, care must be taken to stack the store potatoes in layers, with sand or dry earth between them, and so that each potato may be prevented from touching its neighbours. A trench might be advantageously dug around the store; and if the whole were thatched it would tend to keep them very dry. It will be advisable to delay the operation of clamping as long as possible, to allow the potatos to dry the more thoroughly.

VI. The progress of decay in the spotted potatoes may be stopped (at least for some time) by exposing them in dry situations to the light, but their decay will proceed if they are placed in the dark, or on moist ground.

VII. If the decaying parts are pared off, or cut out, the rest of the potato is perfectly wholesome. Many idle rumours have prevailed to the contrary, which are unworthy of credit.

VIII. If the decaying potatoes have not passed to a state of putridity, they may be safely given to pigs: but they would be improved by being scalded, with the addition of a little salt.

IX. It seems to be a providential arrangement that as yet the really nutritive portion of the potato is very little injured; even in those tubers which have become partially decayed, and appear to be wholly unfit for food. The nutritious portion of the potato consists of delicate white grains of starch-like matter, which are enclosed in little cells. When the cells are broken the grains fall out, and collecting together form a beautifully white flour. It is very easy to separate this flour from the rest of the substance of the potato; and if a few persons in different villages would undertake to make the method generally known among the poor, a vast amount of wholesome food may yet be secured to them, which otherwise they will suffer to perish. From an experiment that has been tried during the past week, it appears that where 12lbs. of flour can be extracted from a bushel of sound potatoes, 8lbs. can be procured from such as have become so far decayed as to be useless as an article of food.

X. To obtain the flour separate from the decaying cells, the potatoes should be first very thoroughly washed, so that not a particle of dirt remains upon them; they should then be finely grated with a bread-grater into a tub of water, and the pulp well stirred about to separate the particles of starch as much as possible from their cells. The whole should then be left to settle, and the heavier particles of starch will soon fall to the bottom, whilst the lighter skin and cells will settle above them, and may be poured off with the water. The mass of flour formed by the settling of the particles should be washed two or three times more, by pouring water upon it and stirring it about, and again leaving it to settle as before. After the flour is considered to be sufficiently washed, it must be spread upon a cloth, placed on a board in the sun, or in a warm room, to dry; or it may be dried in the oven after the bread has been removed. It may then be kept for any length of time, and when wanted, used like wheat flour for making puddings, &c. This process will be sufficient for common purposes, but a more perfect method may be described, by which the potato flour can be procured in its purest state, in which it is frequently sold for arrow-root, and by a variety of other names as a delicate food for weak digestions, for children, and for the sick.

XI. The more perfect process for obtaining the flour in the form of British arrow-root is as follows:

1. Thoroughly wash the potatoes.
2. Peel away the skin, without cutting off much.
3. Grate the peeled potatoes finely into a pulp.
4. Place the pulp on a hair sieve, pour water over it, stirring it about well, till the water ceases to pass through with a milky appearance.
5. The pulp left on the sieve may be thrown away, and the milky water put aside to settle.
6. When the particles of starch have all settled, the water should be poured off, and fresh water added, the whole stirred up afresh, and allowed to settle again.
7. These washings may be repeated four or five times, when the starch will have assumed the character of arrow-root, and will have become white as snow, whilst the water will now be perfectly clear.
8. The prepared flour must be thoroughly dried, and may be kept for any length of time in jars or casks.

XII. When a dish of potatoes is about to be obtained from the inside parts of such as are only partially decayed, instead of peeling them, the decayed parts may be grated, and whatever starch can be extracted from these parts might be added to the boiled potatoes. Thus very little will be lost of the whole amount of nourishment which the potatoes would have contained if they had been quite sound. In many cases it may be more convenient to keep such gratings for three or four days, till enough has been collected to make it better worth while to complete the process.

XIII. In times of scarcity it may be useful for persons to be made aware of the fact, that excellent starch-like arrow-root may be procured from certain wild plants. In the Isle of Portland, some of the poor are in the habit of preparing it from the tubers of the plant commonly called "lords and ladies" (*Arum maculatum.*) The tubers are well washed and grated, and the pulp treated like that of the potato. The process gets rid of an acrid juice with which the fresh tuber abounds. This sort of arrow-root is sold in the neighbourhood of Weymouth for about eightpence per pound.

XIV. It was suggested that local companies or societies might be formed, to buy up the decaying potatoes, and to employ some of the poor to prepare the starch, which could be sold at little or no loss. It is the practice in Scotland, when the store potatoes are found to be frozen, to extract the starch from them in the manner described.

A DESCRIPTION OF A NEW PROCESS FOR THE DETECTION OF ARSENIC IN ORGANIC TISSUES AND FLUIDS.

BY H. LETHEBY, M.B.,

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ALL who have been much engaged in medico-legal inquiries, are aware of the difficulties which beset the detection of arsenic in organic compounds, and when it happens that these difficulties cross the path of the early manipulator, they are truly insurmountable. Now, it is with the view of removing some of them, that I have ventured to trespass upon the attention of your Society, believing that the process which I am about to propose, will not only effect so much, but will be found applicable to all the purposes of the Toxicologist, and to be within the reach of the most inexperienced operator. I may premise, however, that there is no novelty in the principles of the process—on the contrary, it is founded entirely upon the well-known discoveries of Marsh, Lassaigne, Soubeiran, Reinsch, and others, and it may save time if I briefly refer to them.

In the year 1836 Mr. Marsh, of Woolwich, observed that when hydrogen was liberated from any fluid containing arsenious acid in solution, it entered into combination with the metal of this acid, and formed a combustible gas, whose flame exhibited certain very distinctive characters; since then it has been found that the experiment afforded one of the most delicate means of detecting this poison; unfortunately its application could not be made general, by reason of a great many fallacies and impediments which arose out of it. These were considered to be so serious, and the test itself so good, that almost every Chemist used his efforts to remove them, and as a consequence, a multitude of suggestions were put forth, but to my thinking, the whole subject has been complicated rather than improved by it, for scarcely one of them can be made applicable in a judicial inquiry.

It is not my purpose, however, to discuss all these, it will be sufficient if I merely refer to the one or two whose principles have been involved in the subsequent part of this paper. For instance, Lassaigne has proposed to test the gas which is generated during Marsh's process, by transmitting it through a solution of nitrate of silver, having observed that when arseniuretted hydrogen, the gas in question, was brought into contact with such a solution, a double decomposition ensued, the metallic silver being precipitated as black flocculi upon one hand, while on the other, the nascent elements, arsenicum and oxygen, entered into combination, and remained in the solution in the state of arsenious acid. About the same time, Berzelius, Liebig, and some others, proposed a second test for the gas: it was founded on the discovery of Soubeiran, that when arseniuretted hydrogen was made to traverse a red-hot tube, the affinities of its elements were coerced, and the arsenicum deposited in the form of a bright metallic ring; other reactions suggested themselves as the means of proving the nature of this ring. Lastly, in 1842, Reinsch reported that a strip of clean copper had the power, under certain circumstances, of decomposing an arsenical solution, and of precipitating the arsenicum as a steel-gray film, which adhered to the surface of the copper. This was a most important announcement, inasmuch as it appeared to offer a ready means of eliminating the organic matters, which were such a source of impediment. Like many others, I entered into the enquiry with a great deal of expectation, but after some little experience, became convinced that the test was neither certain nor delicate: it was true that the copper would withdraw every and the smallest trace of arsenic, but when this quantity was minute, it was by no means easy to detect it afterwards. Reflecting upon these circumstances, and upon the exceeding delicacy of Marsh's test, I was led to believe that if I were to use some other metal, which had not only, like copper, the faculty of withdrawing the poison, but would also serve for the generation of hydrogen, I might then be able to combine the advantages of both the preceding tests, and at the same time secure a means of avoiding their impediments. In this I was successful, and after experimenting with a great number of metals, found that zinc possessed such a property in the most eminent degree, removing every trace of arsenic from the organic fluid, and forming an alloy from which arseniuretted hydrogen could be developed with the greatest facility. Iron and some other metals have a similar property; but they are objectionable, because of the sulphur and other impurities with which they are contaminated.

The process which I have adopted may be divided into three stages:—

1st. The eduction of the arsenicum.

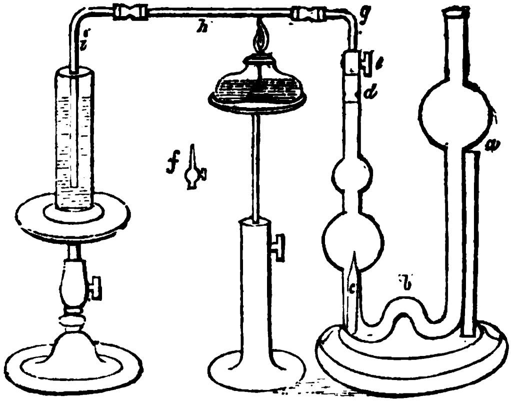
2d. The conversion of it into arseniuretted hydrogen.

3d. The application of the various tests to this gas and its products.

Stage 1. *The Eduction of the Arsenicum.*—The contents of the stomach or other organic liquids are to be slightly acidulated with nitric acid; about ten drops to the ounce will generally be found sufficient, then filtered or strained through muslin, and introduced into a flask with about two drachms of granulated zinc. The whole is to be kept at the boiling-point for half an hour, taking care that the ebullition is not carried on too rapidly, and that the mixture is kept acid by the occasional addition of a drop or so of nitric acid; during this time, the arsenic, if any is present, will be precipitated on the zinc, giving it a grayish-black appearance. The zinc must then be removed, and washed again and again with boiling water, so as to remove every trace of organic matter. It is now in a condition to be used in the second stage of the process.

If we have a solid tissue to examine, such as the liver, intestines, or muscular fibre, a preparatory process must be adopted; it must be cut up into small pieces, and placed in a porcelain evaporating dish, then covered with a mixture of two parts of muriatic acid with one of nitric, and evaporated to dryness, taking care that it does not boil very rapidly during the process; by this means the tissue will be completely destroyed, and the arsenical compound, whatever it may happen to be, converted into arsenic acid. This remains with the charred mass, which is to be broken up, and boiled in two or three successive portions of water, then filtered, and having noticed that the mixed liquors are acid, they are to be introduced into a flask with granulated zinc, and proceeded with as before.

Stage 2. *The conversion of the arsenic into the state of arseniuretted hydrogen gas.*—This is effected by introducing the zinc with some dilute sulphuric acid into an apparatus which I have modified from Marsh's. It consists of two upright stems, connected at the bottom by a piece (*b*) bent as in the figure. One of these stems (*a*) has a single bulb placed near the top, to serve as a reservoir for the acid. The other stem has a couple of bulbs, one large and close to the bottom, the



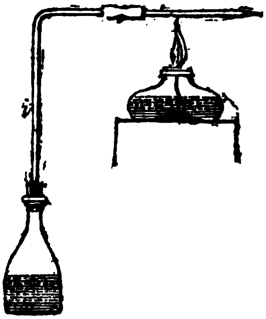
other a little above it—the first serves to hold the zinc, the second to break any bubbles or froth which may happen to rise. The cross-piece (*b*) is bent into the form represented in the figure, for the purpose of preventing any of the gas from backing and escaping through the stem (*a*); and with the view of keeping the zinc from falling into the tube below the bulb in the second stem, it is advisable to introduce a small piece of glass tubing narrowed to a point, and loosely fitting the lower part of the stem, as in the figure (*c*). A cap (*d*) is cemented to the upper part of the stem, and into this the stop-cock (*e*) screws. Two pieces are to be ground air-tight into the upper opening of this stop-cock, and so adapted that they may be removed at pleasure. One of these pieces (*f*) is a jet for burning the gas, the other (*g*) an elbow to which a tube of Berlin glass (*h*) six inches long, and one-eighth of an inch in bore, can be connected by means of caoutchouc or bladder; at the end of this, another tube (*i*) bent once at right angles is adapted, and its lower leg made to dip into a solution of nitrate of silver. All these joints and fastenings must of course be air-tight. When these arrangements are ready, the arsenicated zinc is to be introduced into the bulb, the stop-cock screwed on, and the bent elbow (*g*), with its attached tubes, fixed as in the drawing. On pouring dilute sulphuric acid of sp. gr. 1080, and composed of one acid and seven water upon the zinc, arseniuretted hydrogen will be evolved: this is to be conveyed very slowly through the solution of nitrate of silver, and when it begins to blacken it, the stop-cock may be turned, the bent elbow removed for a time, and the jet (*f*) substituted; we have now the means of firing the gas, and observing the appearance of the flame and its several reactions: if arsenic is present—

(*α*.) On intersecting the flame with a piece of white unglazed porcelain, there will be a black deposit.

(*β*.) On holding a drop of the several reagents on a piece of glass over the flame (not in it), we shall obtain their characteristic precipitates.

(*γ*.) If the combustion is carried on in a glass tube, and the flame made to touch its side, there will be a black and a white deposit, together with the odour of garlic.

I need not say that in carrying out all these experiments we should use as little gas as possible, and that the stop-cock should be always turned during the intervals of operating. Having proceeded thus far, the jet is to be removed and the elbow replaced. Again allow the gas to pass slowly through the solution of nitrate of silver, and while this is in progress, apply the heat of a spirit-lamp to the tube of Berlin glass, placing it as near as possible to the caoutchouc fastening on the instrument side; by this means the gas will undergo decomposition, and a metallic ring of arsenicum deposited. When this is sufficiently distinct, remove the spirit-lamp to its distal side, and there get a second deposit. Finally, when the whole of the zinc has become dissolved and the gas ceases to pass over, take away the fastening which holds the Berlin tube to the elbow (*g*), and separate the two metallic rings by fusing the tube between them and drawing it out; keep one as evidence, and subject the other to the following tests :—



1st. Fit a cork to the bent tube (*i*), which should still be attached to the Berlin piece; adapt it to a small flask containing the ingredients for generating sulphuretted hydrogen, and allow this gas to pass slowly over it, then cautiously apply heat, so as to convert the metallic ring into the yellow or red sulphuret.

2dly. When this is completed, the flask is to be emptied of its contents, and a little muriatic acid put in their place; on boiling this, the gaseous acid will be evolved, and made to pass over the ring of sulphuret—if it is an arsenical one no change will be induced in it, while an antimonial ring will be dissolved.

3dly. Remove the flask with the muriatic acid, and substitute one containing a little liquor ammoniæ, heat will liberate this in a gaseous form, and on its passing over the arsenical sulphuret it will dissolve it—a ring of antimonial sulphuret, or of sulphur alone, would not be affected.

These reactions will point out the nature of the metallic ring, but we have a further means of investigating the product by the application of tests to the solution of nitrate of silver.

1st. Observe how much it has been darkened, and remember that antimony and sulphur will produce a similar discolouration, while, on the other hand, pure hydrogen would have effected no change whatever.

2d. Precipitate the whole of the silver by a slight excess of muriatic acid, boil gently for a short time and filter.

3d. Evaporate the filtered liquid to dryness—then redissolve the residue in a little distilled water, neutralize it with a drop of ammonia and make it boil so as to expel any excess of the latter. On testing it with a solution of nitrate of silver, a brick-dust precipitate of arseniate of silver will be produced, if arsenic had been present; while there is no change, or but a white cloudiness, if it had been antimony or sulphur.

Impediments.—As far as I have yet been able to investigate this process, I have found but one impediment, and that is a salt of mercury, which gives a mercurial coating to the zinc, and so prevents the deposition of the arsenic, and the subsequent action of the sulphuric acid upon it. This, however, must exist in a very considerable quantity to offer any serious impediment, and I do not think, therefore, that it becomes of much import.

Fallacies.—The fallacies which are most likely to be met with are antimony and sulphur, both of which will give a dark coating to the zinc, and evolve a gas which has the power of blackening the nitrate of silver; but these fallacies are completely guarded against in the subsequent stages of the process.

Delicacy of the Test.—Zinc, when boiled in acidulated water which contains the $\frac{1}{200000}$ only of arsenious acid, acquires a coating of the metal, for it is distinctly manifested in the hydrogen apparatus. Again, it is not at all difficult to discover the $\frac{1}{200}$th of a grain, even when mixed with many ounces of organic matter; and, by careful management, it is possible to detect a much smaller quantity.

Advantages of the Process.—These may be summed up in a very few words:—It is of easy application, free from impediments and fallacies, gives certain results, and above all will detect very small quantities of the poison, and that in whatever shape it may happen to exist. One of the best indications of its value is, that while a class of students, during the preceding session, were unable by any other process to detect arsenic in the muscles of a dog which had been poisoned and buried for about eighteen months, yet they were every one of them able by this mode of proceeding to demonstrate its presence clearly and distinctly.

In conclusion, I may just say a word or two upon *the precautions to be observed.*

1st. The solutions are never to be boiled very rapidly in any stage of the process, else small quantities of arsenic will be volatilized.

2d. Always use zinc enough to precipitate the whole of the arsenic in a *thin film*, for if the poison has been present in great abundance, the zinc acquires such a thick coating of the arsenicum, that the whole of it is not subsequently rendered gaseous by the sulphuric acid, but remains in the hydrogen apparatus in the form of black laminæ; when this happens they may be collected on a filter and reduced, and volatilized in a Berzelius tube.

3d. The suspected liquor should never be made so acid as to act upon the zinc and liberate a gas. Nitric acid is preferred, because it does not generate hydrogen, which might be a source of error and disappointment.

4th. It is necessary to wash the zinc very carefully before it is introduced into the hydrogen apparatus, for if a little organic matter remains attached to it, the fluid will froth.

5th. The reduction-tube of Berlin glass must be *entirely* free from lead; this may be known by first heating it, and passing a current of pure hydrogen over it. There should be no discolouration, for if this happens during the process, it is likely either to mislead or mask the results.

6th. Care must be taken that the arseniuretted hydrogen does not pass too rapidly through the nitrate of silver, else it will not suffer complete decomposition; and there will be a difficulty also in getting the metallic ring.

7th. It is of the last importance that the sulphuric acid and zinc should be pure; and to be certain of this it is proper to test them at the beginning, by passing the gas which results from their action through nitrate of silver, and observing that the solution is not blackened.

8th. Delicacy, cleanliness, and care are required in every stage of the process, and no part of the material should be wasted.

ON THE CHANGES PRODUCED ON SOME DRUGS AND PHARMACEUTICAL PREPARATIONS BY THE SOLAR RAYS.

BY MR. ROBERT HUNT.

It has long been noticed that a peculiar change is frequently produced by the continued exposure of medicinal preparations to the influence of daylight, a change not merely in the colour of the article, but in its medicinal properties. To adduce a few instances, ginger (pulv. zingiberis Jam.) loses its fine yellow colour, and becomes white, with loss of its pungency. The powders of the leaves of hemlock (conium), foxglove (digitalis purpur.), henbane (hyoscyamus), &c., become a dirty yellow, and when this change has taken place, it is well known that no dependence can be placed upon these active drugs producing their peculiar influences on the system. The powders of the roots of jalap and ipecacuanha become pale, and, particularly the former, are rendered comparatively inert. The tinctures of cascarilla, catechu, kino, and frequently cinchona, deposit a considerable portion of the vegetable matter held in solution by the spirit on the side of the bottle exposed to the most light; the same result takes place with some others. In chemical preparations, many very remarkable changes take place, which need scarcely be particularized. The changes in oxide of silver, in oxide of mercury, and in nitric acid, have frequently been described. The effect of even diffused light on hydrocyanic acid is familiar to every Druggist, and there can be but few who have not observed alterations in the character of the peroxide of mercury (red precipitate) and the chloride of mercury (calomel) by the action of the sun's rays. The bleaching of the fixed oils and of wax need scarcely be mentioned, but the influence of light upon the resins, with the exception of guaiacum, was never pointed out until the publication of M. Niepce's photographic researches.

I am not aware that any investigations have been made into any of these changes: I am therefore induced to trouble you with a few remarks, the results of experiments which have extended over some years, and which, although far from complete as a scientific investigation, have the merit of some practical and really important applications. I shall not detail my experiments, which have been very numerous and frequently repeated, but, for the present at least, content myself with giving the general results of these researches.

It will be necessary, however, to describe the mode adopted by me in this examination, and the various conditions under which the experiments were made. Having selected the bright green powder of the leaves of the medicinal plants, carefully dried in the dark, and powdered by myself, it was placed in dry and warm glass tubes, and these were then hermetically sealed. Some of these tubes were placed aside in a dark cupboard to serve for comparison with those exposed to light; other tubes of powder were now exposed, day after day, to the action of the rays of a prismatic spectrum, which was maintained in a fixed position, by means of a good heliostat. The tubes were so placed across the spectrum, that each tube was kept under the influence of a particular ray. Although I frequently placed seven tubes in the seven rays of the spectrum I generally used only three, for the following reasons. Sir David Brewster considers that there are but three primitive colours in the solar beam: red, yellow, and blue; and that all the other colours are but compounds of those rays with each other. My researches have proved to me that the three great phenomena of the solar radiations—LIGHT, HEAT, and CHEMICAL ACTION, have their points of maximum power in three distinct parts of the spectrum; the red rays giving the largest amount of calorific power, the maximum intensity of light residing in the yellow rays, and the chemical power being greatest in the blue rays. It will, therefore, now be seen that by using three tubes only, the vegetable powder under examination was exposed to the influence of the heat of the sun's rays—to their light—and to their chemical, or, as I have proposed to term it—ACTINIC power. By this arrangement I soon ascertained that the decolorization of green vegetable powders was not due to the influence of LIGHT, as the powders exposed to the full intensity of yellow light, in which we have the maximum of luminous influence, underwent no change—the alteration of colour was in nearly all cases, but not in all, first set up under the influence of the red rays. No great difference could, however, be detected between the action of the red and the blue rays. Hence we learn, that the change in question is due to the action of the heating and chemical principles of the sun's rays. By using two spectra, and so arranging them that the blue ray of the one fell upon the space occupied by the red ray of the other, we are enabled to examine the combined action of these rays—and I have always found the result to be a very rapid bleaching of all green vegetable powders. The bleaching of the brown and yellow powders—jalap, bark, and ginger, is due almost entirely to the blue or chemical rays. The chemical examinations which I have made of the bleached powders, appear to show that an absorption of oxygen takes place under the action of the chemical rays—but that the heat rays exert their power principally, if not entirely, in removing an atom of combined water.

It will not be difficult to understand how very important the changes effected in the constitution of the organic body must be, when we consider the very great differences in medicinal effects produced in chemical compounds, by the addition or subtraction of an atom of oxygen or of water.

These remarks and results apply with equal force to the resins and the fixed oils. The bleaching of the fixed oils appears to depend almost exclusively on the action of the blue and indigo rays of the spectrum, and although the thermic rays produce a little effect upon the resins, it is in no respect to be compared to the action of the actinic rays, which appear to liberate a portion of oxygen, by which solarized is rendered much more soluble than unsolarized resin. The conversion of linseed oil into a substance resembling caoutchouc under the influence of the air, is very materially modified by the action of the sun's rays, the blue rays accelerating the absorption of oxygen, and the yellow and red rays retarding it.

All the changes which have yet been examined upon the salts of the metallic oxides, appear to be due entirely to the influence of the blue and violet rays, and the alterations in colour and character are dependent upon the liberation of one atom of the gaseous element from the compound. The phenomena connected with these changes are now under investigation by the author of this paper, and will shortly be published in another form.

The decomposition of the hydrocyanic acid under the influence of the solar radiations is also due to the chemically active rays, and I have found that the change has been effected more speedily in the blue and indigo rays than in any others. We have in this case the formation of ammonia, and the precipitation of a brown powder which appears to be a compound of nitrogen and carbon.

Such is a general outline of the results to which my researches have at present led me. It is a very common practice for Druggists and manufacturers to put those pharmaceutical preparations which are liable to change by light into dark purple coloured bottles, or to cover white glass bottles with blue paper, with the idea that the quantity of *light* admitted is then so small, that no change can take place. We learn from these investigations, and the knowledge is of great practical importance, that no plan more efficient for producing rapid decomposition could be adopted than the use of blue glass bottles. Light positively acts as an interfering agent—this light is obstructed by the dark blue glass, and the pure, or nearly pure chemical rays are permitted to act on the preparations with all their energy. If instead of using those kinds of bottles, others prepared of a neat form from the ordinary dark green bottle glass were adopted, there would be but little fear of any decomposition from the solar radiations. Not only does this kind of green glass obstruct the rays of light to a great extent, but nearly all the calorific rays are shut off, and the actinic or chemical rays are reduced in quantity and force in a very remarkable manner.

For bleaching oils there can be no question but purple bottles would be by far preferable to any other colour for the reasons above explained.

London, Sept. 1, 1845.

ERGOT OF RYE.

At the last meeting of the British Association, Dr. R. G. Latham observed—

> "That he considered ergot to be on the increase in this country. When he first began to observe it, eight years ago, he found it on only a few plants; he now found it in great quantities. He had collected it altogether from eighteen different species of grasses. It had also increased on the cultivated grain, and he believed that ergot was at this moment increasing absolutely and indefinitely. A friend of his attributed the increase to the use of animal manure, and stated that he had always found the ergot most abundant in the grasses of churchyards."

We are not quite satisfied as to the accuracy of Dr. Latham's conclusions. We believe ergot to be of much more frequent occurrence among grasses than is usually supposed; but it is in general overlooked. Whenever it is carefully sought for, it is usually found in tolerable quantity. A few summers ago a friend of ours, who was botanising in Greenwich marshes, accidentally discovered no less than eight species of grasses affected with it:

they were, *Hordeum murinum*, *H. pratense*, *Lolium perenne*, *Festuca pratensis*, *Alopecurus pratensis*, *Triticum repens*, *Dactylis glomerata*, and *Arundo phragmites*.

A few years since the attention of the Rev. Professor Henslow was directed to the subject, in consequence of his having undertaken to draw up a Report on the Diseases of Wheat, for the Royal Agricultural Society. He found that ergot was a disease of much more frequent occurrence than he had anticipated. In one autumn he found it "in four different fields of wheat, and gathered more than a dozen specimens," and he adds—

> "I find that some of the farmers here are sufficiently acquainted with it to satisfy me that it must be more common in wheat than has hitherto been suspected. Upon asking my miller to search for me, he very soon picked out about three dozen ergots from two bushels of revel-wheat, which had been sent to be ground at his mill; and he said that he had left at least as many more in the sample. A very cursory look into the mouth of a sack of gleaned wheat then at the mill, also furnished me with three or four more specimens. Should the ergot ever prove abundant in any particular crop, it may be worth while to have it picked out, both for the sake of purifying the sample, and also as a source of profit."

It has been suggested to us, that if the ergot be common amongst the grasses, it may probably prove noxious to cattle. We believe there is no reason to be under any alarm on this point; for Block tells us that in 1811 twenty sheep ate together nine pounds of ergot of rye for four weeks without any ill effects. In another instance, twenty sheep consumed thirteen pounds-and-a-half daily for two months, without injury. Thirty cows took together twenty-seven pounds daily for three months with impunity; and two fat cows took, in addition, nine pounds of ergot daily, with no other obvious effect than that of causing them to yield a milk which gave a bad caseous cream and inferior butter.

It deserves also to be noticed, that when ergot of rye is used by veterinarians to promote the parturition of ruminant animals, they are careful to allow the liquid, through which it is diffused, to trickle down the œsophægean canal, so that it may flow through the manyplies into the fourth or villous stomach; for if it be introduced into the paunch, it remains perfectly inert.

Link, in his report on the progress of Physiological Botany during the year 1841, has given a brief analysis of Mr. Quekett's paper on ergot (*Linn. Trans.*, vol. xviii.), in which this production is ascribed to a minute fungus, called by Mr. Quekett *Ergotætia abortifaciens*. Link then proceeds to criticise the opinion as follows:—

> "Quekett's researches and reasons afford more proof *against* the origin of the ergot from a fungus, than in favour of it. And supposing even that the fungus only did occur in the ergotized grain, and did not grow at all without it, this would yet be no sufficient reason for the assertion that it was the cause of the ergot. Is *Tubercularia vulgaris* the cause of the dryness of wood, because

it is not found upon anything else than dry wood, or only the consequence? I laid drawings of the ergot before the Assembly of Naturalists, at Florence (1841), in which the grains at the point had sprouted out into three leaves; an additional reason in favour of the ergot being only a monstrosity. It still remains to be ascertained, whether the excrescence only occurs on the scutellum. The fungus, which Quekett has very well described, is an *Oidium*. It is well that we can get rid of such an abominable term as *Ergotætia*, badly formed as it is from the Greek and the French. The observations on the different modes of propagation are very interesting; it is a question, however, whether they are not the result of an optical illusion."

We are not disposed to defend the generic term *Ergotætia*; though we by no means agree with the German botanists in their rigid adhesion to the Linnæan canons on nomenclature; as we have always thought "that it is of little real importance what name an object bears, provided it serves to distinguish that object from everything else."

The assertion that Quekett's fungus is an *Oidium* is not new. We heard it made, soon after the appearance of Mr. Quekett's paper, by a celebrated English fungologist.

Link adopts F. Bauer's notion that the ergot is a monstrosity; Quekett, on the other hand, contends that it is a deformity caused by the influence of a parasitic plant. In favour of the latter opinion may be urged the fact that the parasite has been detected in every ergotized grass which has been examined: on this point, English, French, and German writers are agreed. Surely, then, its presence cannot be said to be accidental? Its presence on other parts of the plant than the ovary is no argument against this opinion—indeed, Mr. Quekett admits that it may grow anywhere; but it only gives rise to ergot when it enters the plant and arrives at the ovarium.

There is one very strong fact in favour of Mr. Quekett's opinion, and with which Link appears to be unacquainted. We refer now to the power possessed by this fungus of infecting healthy grains of corn, and of ergotizing them. This fact was ascertained by Mr. Quekett subsequently to the publication of his paper in the *Linnæan Transactions*; but an account of his experiments was published in the *London Medical Gazette*, for the 8th of October, 1841.

Twelve healthy grains of rye, of wheat, and of barley, all grown in neighbouring fields in Surrey, were placed in a little water in a plate, and a few ergots of wheat added. The sporidia of the fungus adhering to the latter were brushed off into the plate by camel's hair pencil, and the ergots of wheat subsequently removed. Another set of healthy grains were then treated in the same way with the sporidia of the fungus obtained from the ergot of *Elymus sabulosus*. The two sets of grains were then covered with glass shades, and in a few days germination commenced. Subsequently the young plants were placed in the ground; but only four of rye, three of barley, and four of wheat grew, and became perfect plants. Of these, every one of the rye, and one of the barley plants were ergotized; but the wheat escaped!

Link's argument for the monstrous nature of ergot, founded on the sprouting out of three leaves from it, appears to us to carry with it little weight. The same occurrence may happen to a deformed as well as to a monstrous growth.

It is scarcely necessary to reply to the doubt raised by Link, whether the observations on the different modes of the propagation of the fungus are not the result of an optical illusion. Mr. Quekett is too well known as a skilful and experienced microscopist to leave any doubt on this point, in the minds of English observers. P.

OBSERVATIONS ON DR. BIRKBECK NEVINS' TEST FOR ASCERTAINING THE PURITY OF DISULPHATE OF QUININE.

BY G. M. MOWBRAY,
Fellow of the Royal Medico-Botanical Society, Member of the Chemical Society, M.P.S., &c.

The following test has been suggested by Dr. Birkbeck Nevins, as appropriate for readily ascertaining the purity of disulphate of quinine.

"To one or two grains of the suspected salt* add three or four drops of sulphuric acid, in a white evaporating dish, and twice as many drops of water; if the salt contains either starch or fatty matters they will remain; whilst, if they are absent, the whole will be dissolved. Let heat be next applied to the solution, and, as it becomes concentrated, the acid will char any sugar which may be present, which will be indicated by a black stain round the edge of the solution, and the whole will speedily assume the same colour."

Allow me to submit that this test is perfectly valueless, and for the following reasons:—Dr. Nevins appears to have overlooked a fact well known to Chemists, whose investigations have been directed to organic compounds, that salts may be readily recognised as belonging either to the organic or inorganic class by heating on platina, if the compound under examination, after heating, yields a carbonaceous residue, then it belongs to the former class; if a whitish ash be left after ignition, then an inorganic compound has been operated upon. Now Dr. Nevins directs us to add sulphuric acid to the disulphate, the effect of this is to convert the salt into the soluble sulphate, and on the application of heat this soluble sulphate, in common with all organic salts, is decomposed, yielding a carbonaceous residue. Could Dr. Nevins have shown that which is opposed to all experimental results with organic compounds, that in the presence of sulphuric acid, quinine is not readily carbonized, and the reverse of this is the fact, as may readily be ascertained by heating a crystal of the soluble sulphate, by the side of a sample of quinine purposely adulterated with sugar or gum, his test might be so far admissible; but as Dr. Nevins has not shown this, and it cannot be shown withal, therefore his test is fallacious.

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* If the acid be added first, the quinine will not be dissolved by the subsequent addition of water; the water should first be added, and then the acid, as many dispensing Chemists have found to their cost.

36, *Paternoster Row.*

[We cannot coincide in opinion with Mr. Mowbray in his unqualified condemnation of Dr. Nevins's test. In our last number a precaution was pointed out by Dr. Nevins himself, an attention to which would, we think, obviate the chief source of fallacy. Mr. Mowbray states that, on the application of heat to the solution of disulphate of quinine in oil of vitriol, "the soluble sulphate in common with all organic salts, is decomposed, yielding a carbonaceous residue." This is an error: disulphate of quinine forms an exception to the general rule, and may be boiled in strong oil of vitriol without becoming blackened. Upon this fact is founded the test recommended by Dr. Nevins. It is true that if the salt becomes dry round the edges of the boiling liquid, it will cease to be protected by the oil of vitriol, and will become charred like other organic substances, as Dr. Nevins has stated.

We think a modification of the test might be adopted with advantage, which consists in dropping the disulphate to be tested into cold oil of vitriol undiluted. If pure, no change of colour is produced. If sugar be present a blackness will gradually ensue. Salicine under similar circumstances produces a bright red colour. By previously moistening the salt with a drop or two of water, the action of the test is more speedy. Mr. Mowbray is in error in stating, that if the oil of vitriol be added undiluted to the disulphate the salt will not be dissolved by the subsequent addition of water.—ED.]

ON THE EXISTENCE OF PHOSPHORIC ACID IN ROCKS OF IGNEOUS ORIGIN.

BY GEORGE FOWNES, PH. D.

THE important although obscure functions attributed to the elementary body phosphorus, both in the vegetable and in the animal kingdoms, and the well-known fact that rocks of nearly every description afford on disintegration soils more or less capable of supporting the life of plants, and from which consequently phosphoric acid cannot possibly be absent, seemed to render a search for that substance in rocks of igneous origin generally very desirable, because if there found, an easy and satisfactory explanation of the origin and first source of the element in question would be given. As I am not aware that any direct researches on this subject have yet been made, or at least placed on record, I venture to submit to the notice of the Royal Society the results of a few experiments made by myself, which, so far as they go, resolve the question in the affirmative.

The first substance tried was the fine white porcelain-clay of Dartmoor, Devon, the result of the disintegration of the felspar of the granite of that district. This is one of the chief components of porcelain and of the finer kinds of English earthenware, and was found on analysis to correspond very closely in composition with that of the material employed in the manufacture of the Sèvres porcelain. It was thought that phosphoric acid, if present, would be in combination with a portion of the alumina: and as the phosphate of that earth is readily soluble in dilute mineral acids, while the silicate offers great resistance to these agents, mere digestion with acid would suffice to extract the whole, or the greater part of the phosphate, which could be afterwards precipitated by an alkali, and examined.

With this view, 1000 grains of the clay were boiled during several hours in a flask with a quantity of pure dilute hydrochloric acid; a large bulk of distilled water was then added, and the whole allowed to rest until perfectly clear. The acid liquid was then carefully decanted from the undissolved clay, evaporated in a porcelain basin to a small bulk, and precipitated by a slight excess of pure ammonia. The scanty, reddish precipitate obtained, which consisted chiefly of alumina and oxide of iron, was collected upon a little filter, thoroughly washed with distilled water, dried, and ignited. It was next reduced to fine powder, and mixed with an equal weight of pure silica in a finely divided state, and six times as much anhydrous carbonate of soda. This mixture was heated to fusion in a platinum crucible. When cold, the melted mass was acted upon by boiling water, and the soluble and highly alkaline portion separated by a filter from the insoluble silicate of alumina. The solution was mixed with excess of nitric acid, evaporated to dryness, water added, and the product filtered. The liquid thus obtained was divided into two portions; one of these was carefully neutralised by a little ammonia, and mixed with a few drops of solution of nitrate of silver; a distinct yellow precipitate appeared, which was freely soluble in dilute nitric and in acetic acids. The second portion was mixed with excess of ammonia and some hydrochlorate of ammonia, and a few drops of solution of sulphate of magnesia added. After a short interval, a crystalline, granular, white precipitate, the ammonio-magnesian phosphate made its appearance, which increased in quantity by agitation.

This experiment, which demonstrates the presence of a small quantity of phosphoric acid in the clay, in a most unequivocal manner, was several times repeated with a like result. The purity of the acids, carbonate of soda, and other materials employed, were rigorously tested, and filtration through paper of the original acid liquid purposely avoided, lest a trace of earthy phosphate should have been dissolved from the paper.

The porcelain-clay is extracted from the disintegrated granite by mere washing with water, and subsidence, and the water of the district in which it is found is, in all probability, exceedingly pure. It was thought worth while, however, to examine in the same manner the decomposed rock, which had not been subjected to any artificial treatment, and a specimen taken by myself from the quarry was chosen for the purpose. The result showed the presence of phosphoric acid as in the clay, and apparently to about the same extent, allowance being made for the quartz-grains, mica, &c.

In the examination of unaltered felspar, I failed, unfortunately, in getting a conclusive result. The mineral, although reduced to very fine powder by trituration in a mortar of Swedish porphyry, was found to be so hard and dense as to resist completely the action of the acid at a boiling temperature. An insignificant quantity of oxide of iron was dissolved out, in which no phosphoric acid could be detected. 200 grains of the powdered felspar were then fused with a large excess of carbonate of soda: the mass was treated with water, filtered, the solution supersaturated with nitric acid, and evaporated to dryness; water was poured upon the residue, and the whole placed upon a filter. The solution was then examined, as before, for phosphoric acid, but with an indistinct and doubtful result. Too small a quantity of the felspar had been used, and the mass of nitrate of soda present interfered too seriously with the action of the tests to render their evidence of any value. A far better mode of investigation would be, to act upon the powdered mineral with hydrofluoric acid, in the manner recommended by some analysts in the examination of natural silicates containing an alkali; not being, however, in possession of the necessary platinum vessels, I was obliged to abandon the attempt.

Other substances were then tried with very decisive results. The method of proceeding adopted was very much the same as that already described. The minerals were very finely powdered in the porphyry mortar and boiled, as before, with dilute hydrochloric acid. All were much more readily attacked than the porcelain-clay, and yielded solutions containing a large quantity of alumina and oxide of iron. The liquid was separated from the insoluble part by decantation, evaporated nearly to dryness, water added, and then an excess of ammonia. The copious, bulky precipitates obtained were washed and digested in dilute acetic acid, which has the property of dissolving with great facility both oxide of iron and alumina, while it leaves untouched the phosphates of those bases. The undissolved residue was dried, ignited, fused with silica and carbonate of soda, and the product examined in the manner already described. The addition of silica is indispensable to the retention of the whole of the alumina in an insoluble condition. Phosphate of alumina is not decomposed by carbonate of soda by fusion, or only partially, and is besides soluble in an aqueous solution of that salt.

The results of the examination may be thus briefly stated:—

Dark gray vesicular lava from the Rhine, used at Cologne as a building-stone, being exceedingly strong and durable.—Enough phosphate of soda was extracted from 1000 grains of this substance to exhibit the yellow phosphate of silver, and the phosphate of magnesia and ammonia upon a large scale. The phosphoric acid might be said to be here *very abundant*, that is, comparatively speaking. No attempt was however made to estimate it quantitatively, as the operation is attended with great difficulty, and the result of doubtful value from the unavoidable errors of experiment bearing too large a proportion to the quantity of the substance.

White trachyte of the Drachenfels, near Bonn, on the Rhine.—This rock is apparently as rich in phosphoric acid as the preceding; nothing could be more distinct and satisfactory than the indications of the reagents.

Dark red, spongy, scoriaceous lava from Vesuvius.—This was tried in the same manner, and yielded *abundance* of phosphoric acid.

Compact, dark green basalt, or toadstone, *from Cavedale, Derbyshire.*—This substance was very tough, and difficult to powder. Enough phosphate of soda was, however, extracted from 750 grains of the rock to exhibit very unequivocally the characteristic tests described.

Dark blackish-green, extremely strong basalt from the neighbourhood of Dudley, termed *Rowley-ragg*, gave a very similar result. Phosphoric acid is not so plentiful in these substances as in the lava, although its presence is easily rendered evident.

An ancient porphyritic lava containing numerous crystals of hornblende, from Vesuvius.—The phosphoric acid was here very distinct, but not so abundant as in the more recent lava.

A specimen of tufa, or *volcanic mud*, also from Vesuvius, was found to contain phosphoric acid in notable quantity.

These were all the substances tried: they were taken, as is at once seen, indiscriminately from igneous formations of many localities and many ages, and they all, with one doubtful exception, in which practical difficulties interfered with the inquiry, yielded phosphoric acid. It is highly probable, therefore, that this substance is a very usual, although small, component of volcanic rocks.

It is not unlikely that the remarkable fertility possessed by soils derived from the decomposition of some varieties of lava may be, *in part at least*, due to the presence of this phosphate in the original rock, although much must of course be ascribed to the alkali, especially potash, which these substances contain, and which is gradually brought by the continued process of disintegration into a soluble state. There can be little doubt that the matter erupted from time to time from the interior of the earth, in a state of fusion, is thus destined to renew the surface from which the more valuable and more soluble components have gradually been removed by the action of water and other causes constantly in operation. If it should hereafter be found on a more extended investigation that phosphoric acid, although present in all igneous rocks, is most abundant in those of modern date, the fact will thus receive an explanation, the more ancient lavas having been most changed by the slowly-acting and almost imperceptible causes in question. One might be tempted to consider lava as a kind of fundamental material, from the subsequent alteration of which all others are derived, and expect it to contain, here and there at least, traces of all the elementary bodies known, even those most rare. In the present case, it cannot be altogether devoid of interest to trace to its first source the enormous quantities of phosphoric acid, for the most part locked up in a temporarily insoluble condition in the vegetable and animal kingdoms, and in the various strata of calcareous and sedimentary deposits, in the formation of which organized beings have played so prominent and so important a part.—*Philosophical Transactions.*

6, *Coventry Street, April* 17, 1844.

ON THE SUPPOSED OCCURRENCE OF PHOSPHORIC ACID IN ROCKS OF IGNEOUS ORIGIN.

BY PROFESSOR C. KERSTEN.

In the *Philosophical Magazine*, vol. xxiv., p. 467, is an abstract of a paper by Mr. Fownes, on the occurrence of phosphoric acid in rocks of igneous origin. Mr. Fownes asserts that he found small quantities of phosphoric acid in combination with alumina, &c., in all these rocks, and supposes that it is probably to this presence of phosphoric acid that many soils, which have originated by the decomposition of those rocks, owe their fertility. He found phosphoric acid in a porcelain-clay from Dartmoor, in the gray vesicular lava from the Rhine, and in the white trachyte from the Drachenfels on the Rhine, in tolerable quantity in the two latter rocks; further, in several basalts, in porphyritic lava inclosing crystals of hornblende from Vesuvius, and in volcanic tufa from the same locality in considerable quantity. As these observations of Mr. Fownes appeared of some importance in a geognostical and agricultural point of view, and, as far as I am aware, no phosphoric acid had hitherto been detected in the above-mentioned rocks, I was induced to repeat Mr. Fownes's experiments.

The following rocks were examined for phosphoric acid:—1st, Porcelain earth from Aue in Saxony; 2d, Porcelain earth from Bayonne; 3d, Gray vesicular lava from Niedermennig on the Rhine; 4th, White trachyte from the Drachenfels; 5th, Basalt from the Meissner in Hessia; 6th, Trass from Vesuvius.

The following was the mode of examination:—The finely-pulverised rocks were fused with four times the quantity of chemically-pure soda, the fused masses digested in water, and the liquids filtered from the insoluble residues neutralized with nitric acid. These neutralized liquids were now evaporated to dryness, and after treatment with water and separation of the silicic acid, tested with nitrate of silver and the other known reagents for phosphoric acid.

In all the above rocks, however, *not the least trace of phosphoric acid* could be detected; consequently the above-mentioned observations of Mr. Fownes are founded on some error. In the gray vesicular lava from Niederminnig there was found a quantity of *chlorine*; and on boiling it in the pulverized state with water and evaporating the liquid, small quantities of *chloride of sodium* were obtained; at the same time with this a brown organic substance was extracted, which coloured the water brownish on evaporation and was carbonified on ignition.—*Journal für Prakt. Chem.*, March 31, 1845, and *Chemical Gazette.*

[It is worthy of remark, that the mode of examination adopted by Professor Kersten is precisely that which Mr. Fownes found to be inapplicable for the detection of the phosphoric acid.—Ed.]

ON THE PRESENCE OF PHOSPHORIC ACID IN ROCKS AND MINERALS.

BY WILLIAM SULLIVAN, ESQ.

In a recent paper in the *Philosophical Transactions*, Dr. Fownes showed the presence of phosphoric acid in several igneous rocks, and having made some investigations on the same point, I may perhaps be allowed to state them here. About two years ago, Professor Liebig mentioned to me the importance of examining different rocks in order to ascertain, if possible, the presence of phosphoric acid in them, as he considered very naturally that it must be universally present in all soils and in the rocks from which they are derived, as we invariably find it in the ashes of plants. In the winter of 1843-44, I made a number of analyses in order to see how far this idea could be borne out, and also to show that impure limestones were better adapted for agricultural purposes than those usually preferred. To these analyses I have since considerably added; but the only publicity I gave the matter up to the present time, was a short notice which was published in a Cork newspaper about a year and a half ago, intended principally for the information of the agriculturists of that locality.

The ordinary method employed for the detection of phosphoric acid I found not to answer where the quantity of that substance is very minute; and besides, it is likely to give erroneous results where large quantities of iron, alumina and lime, are present. Indeed, it is chiefly owing to phosphoric acid being thrown down along with these bases in the analyses of minerals containing this acid only in minute quantities, that its presence in most substances of mineral origin has hitherto escaped detection.

The mode which I adopted, is capable of giving the most accurate results,—in fact the most minute quantities possible may be detected with certainty. The following is the method:—

When the mineral was limestone, or a substance containing a large quantity of lime, I took about four ounces of it broken into fragments, introduced it into a covered crucible and exposed it for three or four hours to a strong white heat; the mass thus treated was then digested in water, when I suspected the substance contained potash or soda, in order to dissolve out these bodies, and strong hydrochloric acid poured on the remainder (if I did not wish to examine for potash, the ignited mass was directly treated with the hydrochloric acid); the whole was then evaporated to dryness, the dried mass moistened with a few drops of hydrochloric acid, and then treated with water and filtered to separate undissolved silica; ammonia was then added to the solution, the precipitate collected, well-washed and dissolved in hydrochloric acid; if the mineral contained no iron, or but little of that substance, a few drops of perchloride of iron were added to the solution and then excess of acetate of potash; if phosphoric acid was present in the most minute quantity, a precipitate, at first light brown, but gradually darkening as it falls to the bottom of the glass, of phosphate iron was obtained, as this substance is totally insoluble in acetate of potash. If the precipitate do not immediately make its appearance, it should be allowed to stand for some time, when it will be perceptible. It sometimes happens, when the quantity of the phosphoric acid is extremely minute, that it does not deposit itself for twelve hours; and in one or two instances it did not occur until after twenty-four hours. When the precipitate obtained was large, which was usually the case from the large quantity of the substances employed in the analyses, I invariably verified the result by redissolving the precipitate thus obtained and testing with sulphate of magnesia and ammonia and nitrate of silver, which always afforded well-known results where phosphoric acid was present.

The substances which did not contain lime enough to be treated in the preceding manner were reduced to powder and fused with a mixture of carbonates of potash and soda, or where it was of importance to ascertain the presence of potash, with caustic barytes, and I then proceeded as in the other case.

It may not be unimportant to mention here, that potash, or rather potash and soda, appear to be as universally present as phosphoric acid: indeed, in none of the minerals which I examined was it totally wanting, though there was frequently but a mere trace.

The following is a list of the minerals which I examined for phosphoric acid. I have also noticed those in which potash and soda occur, that is, those rocks in which these substances had not hitherto been noticed.

MINERALS.	PHOSPHORIC ACID.	ALKALIES.
Nine varieties of *carboniferous limestone* from the neighbourhood of Cork.	In all I could detect its presence, and in one it occurred in sufficient quantity to be determined.	Potash was found present in all, but in such small quantity that I could not determine it. From the same cause I could not determine whether soda was present.
Muschelkalk and *dolomite* from the same formation, from near Fulda in Hesse-Cassel.	Present, but apparently more abundant, in the dolomite.	Minute traces.
Roofing-slate used at Giessen.	Considerable precipitate, but *wavellite* is found in some localities in the same rock.	Large precipitate with chloride of platinum, and a small trace of soda.
Flags used in the west of Ireland, supposed to be *millstone grit.*	Traces, but very minute.	Trace of potash, but could not ascertain if soda was present.
Slate from Corrigaline, near Cork.	Precipitate large enough to examine quantitatively. [This is the best locality known, I believe, for wavellite.]	Decided precipitate with chloride of platinum. Sufficient soda to produce a precipitate with antimoniate of potash.
Old red sandstone, Cork.	Trace in one specimen, but a decided precipitate was obtained from three ounces of another,	Could not detect soda, but detected a trace of potash.

MINERALS.	PHOSPHORIC ACID.
Diorite, containing augite, from the valley of the Lahn, Nassau.	Obtained sufficient from two ounces to test with nitrate of silver.
Clinkstone, from Rhöngebirge, Bavaria.	Abundant traces.
Phonolitic Tufa, Rhöngebirge, Bavaria.	Considerable precipitate.
Hornblende in crystals, from Rhongebirge.	Minute traces.
Olivine in a state of decomposition, from the Vogelsgebirge, Hesse-Darmstadt.	Sufficient to apply the test of nitrate of silver; but three ounces were employed.
Augite, crystalline, Rhöngebirge.	Abundant traces.
Compact basalt, from Giessen.	Considerable traces.
Trap rock, of the nature of green-stone, from the north of Ireland.	Only minute traces in one specimen, but in considerable quantity in another.
Basalts, Giant's Causeway.	Enough to produce a precipitate with sulphate of ammonia and magnesia from two ounces.
Pumice stone, from the Lake of Laach, near Andernach, on the Rhine.	Considerable precipitate from three ounces.
Sodalite, Vesuvius.	Trace; had not enough for a second analysis.
Variety of *hypersthene*, occurring in the diorite on the Lahn, Nassau.	Distinct traces.
Lepidolite, locality unknown.	I obtained so large a precipitate, that I think it must form an important constituent of this mineral.
Obsidian, from Lipari.	Present in considerable quantity.
Mica, Spessart, Bavaria.	Minute traces, but more abundant in another specimen from Russia.
Granite, Odenwald, Germany.	Enough to give all the usual tests from about 1½ ounce.
Chlorite slate, locality unknown.	Sufficient from two ounces to give a precipitate with nitrate of silver.
Augite porphyry, locality unknown.	Considerable traces.
Mica slate, locality unknown.	Enough for nitrate of silver test.
Gneiss, Odenwald, Germany.	Considerable traces from two ounces.
Two specimens of Scotch *granite*, localities unknown.	Large precipitate from two ounces.
Tincal, or Native borax, from East Indies.	The quantity of phosphoric acid in this substance was very considerable, being equal in one instance to 2.13 per cent. I think most native borax will be found to contain phosphate of soda.
Datholite	In one specimen of this mineral from Andreasberg in the Harz, the quantity of this acid present was sufficiently large to be estimated. I also detected its presence in a specimen from North America, but in neither case had I enough of the mineral to make another analysis.

It is very curious that such a large quantity of phosphoric acid should in these two cases be associated with boracic acid, which is of a decided volcanic origin. It would be very interesting if the substances occurring with the native boracic acid in Tuscany, and also the other minerals containing boracic acid, were examined for phosphoric acid. The quantitative determination of the phosphoric acid in rocks would, in my opinion, be of little importance, as phosphoric acid, although a constant, is a very variable constituent. This, however, does not apply to the simple minerals, such as olivine, of which it forms very probably a constant constituent.

Dublin, July 17, 1845.

ON THE ACTIVE PRINCIPLE OF DIGITALIS.

BY M. HOMOLLE.

In a *mémoire* on the Digitalis purpurea, read before the Society of Pharmacy of Paris, by M. Homolle, the author gives the following *resumée* of the points previously established, with reference to the active principle of that plant:—

1st. That it is in the bitter matter that the active principle of Digitalis resides.

2d. This bitter matter is soluble in alcohol; it is a little soluble in ether, according to the greater number of experimenters; it readily dissolves in water, with the aid of substances with which it is strongly combined and mixed.

Moreover, it has not hitherto been isolated, and all the Chemists who have been occupied with the investigation, have only obtained a deliquescent extractive matter, more or less coloured, and always of a complex composition; their opinions also are quite contradictory with reference to its chemical nature, and the class of bodies to which it belongs.

Finally, Analysis has shown that digitalis contains an acid, partly free and partly combined, probably with the bitter principle, and resembling gallic acid. There has also been found in it, a volatile oil, a fixed fatty matter, a red extractiform colouring matter, chlorophylle, albumen, starch, sugar, and gum, together with salts of potash and lime.

With regard to the methods of treatment employed, most of them have appeared to us objectionable, on account of the numerous and complicated manipulations required.

The results furnished by the investigations on digitalis, to which we have already alluded, have induced us to adopt the following as the basis of our researches:—

1. To avoid the employment of heat.
2. To treat the dry plant, coarsely powdered, by the process of displacement.
3. To act directly on the liquors thus obtained by way of elimination.

The following are the results obtained:

The liquor obtained from the digitalis by means of displacement, was immediately and directly deprived of extractive and colouring matter by subacetate of lead, and the excess of the latter removed by subcarbonate of soda, which also precipitates the greater part of the salts of lime. Treated, afterwards, successively with oxalate of ammonia and ammoniacal phosphate of soda, to remove the rest of the salts of lime and magnesia (the latter of which, not noticed by previous experimenters, contributed to retard our progress) the liquor was precipitated by tannin, which takes away the greater part of the bitter principle. It remained to obtain the latter from the precipitate formed by means of tannin; we very naturally thought of the subacetate of lead; setting out with the hypothesis, that the bitter principle may be an alkaloid, and we thus thought to obtain it by double decomposition, an insoluble tannate of lead being formed, and a sub-salt of digitaline, which might be removed by alcohol.

But here also new obstacles presented themselves; difficulties inherent to the employment of subacetate of lead, obliged us to review successively the employment of various bodies capable of forming insoluble compounds with tannin, and of disengaging the bitter principle from its combinations. Finally, the oxide of lead (litharge, in fine powder) mixed in certain proportion with the tannin precipitate, still moist, enabled us to obtain a product, easily brought to a state of purity.

The following is the process:—A kilogramme (2.205 lbs. imp.) of the dried leaves of digitalis, coarsely powdered and moistened, is put into a displacement apparatus, to be treated with water. The liquors obtained being mixed, are immediately precipitated with a slight excess of subacetate of lead, and thrown on to a filter. The liquid passes clear and almost colourless, yet retaining all the bitterness, and presents a slightly acid reaction. Carbonate of soda is added to the solution until it ceases to give any further precipitate. It is now filtered, and the liquid deprived of the lime it contains by means of oxalate of ammonia, and of the salts of magnesia, by ammoniacal phosphate of soda.

The filtered liquors present a decided alkaline reaction, have a yellowish brown tint, and are excessively bitter. A solution of tannin in slight excess is now added, and the precipitate formed is collected on a filter, pressed between folds of unsized paper, and mixed while still moist with one-fifth of its weight of finely powdered oxide of lead. The resulting soft paste is then thrown on to a filter to drain, pressed between folds of unsized paper, and finally put into an oven to complete the drying. It is then powdered and exhausted by concentrated alcohol.

The alcoholic solution obtained, sufficiently evaporated at a gentle heat, leaves as a residue, in the form of a yellow granular mass floating in a small quantity of mother liquor, the bitter principle still retaining traces of oil, of salts, and extractive matter.

This mass is washed with a little distilled water, which removes the deliquescent salts present, without sensibly dissolving the bitter principle. It is allowed to drain, and is then taken up by boiling alcohol, at the same time adding a sufficient quantity of purified animal charcoal. These are boiled together and thrown on a filter. The liquid passes colourless; allowed to evaporate spontaneously in a stove, the bitter matter is deposited in part, in thin light semi-transparent scales, on the sides of the capsule, and partly at the bottom of the capsule, in the form of whitish granular, agglomerated flocks.

The product, perfectly dried and powdered, is treated with rectified ether. These are allowed to remain in contact for twenty-four hours, then boiled and filtered. This ethereal solution, allowed to evaporate spontaneously, leaves as a residue a light, white crystalline layer, consisting of a certain proportion of the bitter principle, a trace of green oleo-resinous matter, an odorous matter smelling of digitalis, and a substance crystallized in fine needles, white, inodorous, of a rough taste, with a little acridity, insoluble in water and in alcohol, fusible at a temperature we have not yet determined, but which we believe to be a little above 302° Fahr., and on cooling, assuming the appearance of a yellow radiated crystalline mass. The small quantity which we have hitherto been able to isolate, prevents our giving a further statement of its properties, but we intend pursuing the study of it, as soon as we have obtained a sufficient quantity for the purpose.—*Journal de Chemie Médicale.*

ON ORIENTAL COPAL.

BY X. LANDERER, OF ATHENS.

It is well known to Pharmacologists that there are three varieties of copal, differing from each other in their properties; *viz.*, *Brazilian*, *West Indian*, and *East Indian* or *Levantine copal.* Of the latter variety I have received the following account from an apothecary, who has lived twenty years in the East:—

This Levantine copal is sold in the bazaars of Jerusalem, Mecca, and other places, as a species of choice incense, and is chiefly employed as incense on the altars of Mahomed. It is met with in pieces varying from the size of an egg to that of a walnut or a bean, and is so covered with a coating of dust, that it can only be recognised as copal by breaking it. This coating consists of sand and ferruginous clay, and is said to be produced by the soil in which the gum drops from the tree, as the heat of the sun causes it to exude from the stem. The people employed in the collection of the copal, in Palestine and Abyssinia, dig deep trenches round the tree, and then collect and sort the pieces of gum which fall into them. If the pieces can be easily freed of the earth adhering to them, they are placed in hot sea-water, and purified, as far as it is possible, with a brush made of rushes; they are then placed on a mat of rushes and dried, until they appear to be superficially melted by the heat of the sun. If the adherent earth cannot be readily removed, it is sliced off with a very sharp instrument, when the pieces are yet soft from exposure to the heat of the sun.

Copal plays a very leading part in all the fumigating drugs of the East.—*Repertorium für die Pharmacie*, Band xxxvii. Heft 2.

PREPARATION OF IODOFORM.

BY M. CLARY.

TAKE one kilogramme (2lbs. 3ozs. avoirdupois) of water, mixed with one-seventh or eighth of alcohol; add 100 grammes (3ozs. 230 grains avoird.) of iodine, and the same quantity of bicarbonate of soda, and gently heat the mixture over a water-bath, to determine the reaction. In a little time aqueous vapour will be disengaged, mixed with acetic ether and a little iodine, especially if the temperature be somewhat elevated. After two or three hours, the liquid having become colourless, a fresh quantity of iodine is to be added so long as the liquid is capable of decolourising it. The precipitate which forms is to be washed with cold water and dried.

By employing bicarbonate of soda instead of bicarbonate of potash, which latter has generally been used in the preparation of iodoform, a much more beautiful and abundant product is obtained.—*Journal de Chimie Médicale.*

REDUCTION OF CHLORIDE OF SILVER.

M. OERCHSIE, controller of the mint at Paris, employs galvanic action for reducing the chloride of silver obtained in assaying alloys by the humid way. The following is said to be the most simple method of conducting the process: The chloride of silver, well washed, is placed, in contact with a plate of zinc, in a porcelain capsule, and heated; if it is desired to expedite the process, a few drops of sulphuric acid may be added. The silver is in this way reduced in a very short time.—*Journal de Chimie Médicale.*

SINGULAR EFFECT PRODUCED ON THE TEETH BY THE ADMINISTRATION OF IODIDE OF IRON.

BY M. GIOVANNI RIGHINI.

A LADY affected with a strumous affection was taking with advantage the proto-iodide of iron in the form of pills. After having gradually augmented the dose, she all at once perceived that her teeth, which were previously very white, had become quite blue. Alarmed at this result, she applied to the medical man, who soon assured her that the unexpected effect was purely accidental, arising from the liberation of a little iodine, which was exhaled in the state of vapour. The blue colour was immediately removed by using a solution of carbonate of soda.—*Journal de Chimie Médicale.*

ON THE PRESENCE OF ARSENIC IN OIL OF VITRIOL.

M. DUPASQUIER states, that the arsenic present in commercial oil of vitriol, is in the state of arsenic acid; that it is met with in variable proportions, but may be estimated on an average, at about a seven or eight-hundredth; that the use of hydrochloric acid, as well as of sulphuretted hydrogen, is insufficient to purify the oil of vitriol from this contamination; that the employment of an alkaline sulphuret offers the means, at once complete and easy, of effecting the purification. He recommends sulphuret of barium as the best reagent for purifying oil of vitriol contaminated with arsenic.—*Journal de Chimie Médicale.*

DIAGNOSIS OF SUGAR IN URINE.

BY HELLAR.

Boil a few drops of the suspected diabetic urine in a small test-tube with a solution of caustic potash; if sugar be present, an intensely brown-red fluid will be formed, which is of a beautiful dark orange colour when viewed in thin layers. If an excess of nitric acid be now added, a strong odour will be developed by the sugar. If a drop of diabetic urine be diluted with ten drops or even more of water, the presence of sugar will still be shewn by the above test. Cane sugar does not yield the same result; but if it be oxidized by heating it with a small quantity of nitric acid, nitrous acid escapes; and if it be now heated with caustic potash the beautiful brown-red substance is formed as from the diabetic sugar. If nitric acid be again added and heat applied the odour of treacle is developed.—*Pharmaceutisches Central Blatt*, No. 21.

MOHR'S NEW PROCESS FOR OBTAINING IODIDE OF POTASSIUM.

(*From Geiger's Pharmacopœia Universalis.*)

Take sulphuret of barium (prepared in the usual way from two lbs. of heavy spar, ℥v of powdered charcoal, and ℥i of colophony). Powder, and sift it, preserving the fine powder in hermetically closed bottles. Mix ℥xvj. of iodine in ℔vj. or ℔vij. of distilled water, and put the mixture in a porcelain saucer, gradually adding of the powder of the sulphuret of barium a sufficient quantity to render the brownish yellow fluid colourless. Whilst adding the powder the solution must be continually stirred. Heat the solution to the boiling point, and add ℥xj. of sulphate of potash; boil for a quarter of an hour, and filter. After washing the residue, evaporate the filtered solution so as to crystallize.

The advantage of this process is that the iodide thus formed cannot be rendered impure by the presence of chloride of potassium, or carbonate, or iodate of potash.—*Repertorium für die Pharmacie, zweite Reihe*, Band xxxviii. Heft. 2.

ON CETRARINE.

BY DR. SCHNEDERMANN.

The *Cetrarine*, or bitter extractive of Iceland moss, has been found to consist of a mixture of three different non-nitrogeneous substances, not easily separable.

1. The *first substance*, to which the name of *Cetraric acid* may be given, is of an acid nature, and gives to the Cetrarine its bitter taste. It forms very beautiful colourless prismatic crystals of a very bitter taste. Its formula is $C_{34} H_8 O_{15}$. On uniting with bases it does not part with its water. The crystallized salt of ammonia is $= N H_3 + C_{34} H_8 O_{15}$. The salt of lead $= 2 PO + C_{34} H_8 O_{15}$.

2. The *second substance* is a *fatty acid*. It crystallizes from an alcoholic solution in oblique quadrilateral plates with a lustre of satin; it is easily melted, and forms, with bases, salts which are very similar in property to those of the other fatty acids. Its composition is $= HO + C_{29} H_{12} O_5$; in the salts, one equivalent of the base takes the place of one atom of water.

3. The *third substance* separates from alcohol in very indistinct fine needles, which are concentrically grouped; it is not an acid, but a neutral substance.—*Annalen der Chemie und Pharmacie*, Band liv. Heft 1.

FATAL MISTAKE.

The subjoined is extracted from a Hampshire paper of last month.

"An inquest was held by Mr. Todd, at Tufton, near Whitchurch, on the body of John Hatt, the infant child of Henry Hatt, a labourer in that parish, whose death was occasioned by poison under the following circumstances:—The nurse, finding the child fretful, requested his father, who was going into Whitchurch, to purchase a pennyworth of syrup of rhubarb for him. The father accordingly went to the shop of Mr. Withers, a respectable grocer in that town, and after purchasing several other articles, produced a phial bottle, and asked (according to his own account, which was corroborated by another witness, who happened to be in the shop at the time), for 'a pen'north of spirits of rhubarb,' but the young woman who served him understood him to say 'spirits of vitriol,' and declared that he only mentioned rhubarb in reply to a question from her as to what the bottle had previously contained. At all events, vitriol, in one of its strongest forms (sulphuric acid, or oil of vitriol), was the article supplied. On the bottle was a printed label marked 'Godfrey's Cordial,' which was not removed, but the young woman tied a rough piece of paper to the neck of the bottle, upon which she wrote the word *Poison*, and immediately delivered it to the father, without a syllable being said on either side as to the nature of its contents, or the purpose to which they were to be applied, except that Mr. Withers himself, who stood behind the counter at the time (being under the impression that vitriol was the article required), observed that 'it was twice as strong as usual, so that half the quantity would do.' The newly-written label being delivered to the man before the ink was dry, was immediately rendered illegible, but otherwise it would have been of no use, as neither the father nor the nurse could read; and, unfortunately, to complete the deception, and do away the only remaining chance of its discovery, the liquid itself was in such an impure state that its colour and general appearance exactly resembled the article which had been sent for. The nurse, therefore, without the slightest suspicion, proceeded to administer a dose of half a teaspoonful to the infant, but the moment it touched his lips he began to struggle, and almost immediately exhibited symptoms of suffocation, although not more than two or three drops of it passed into his mouth. The nurse instantly cried out that the child was poisoned, and threw the remainder of the dose into the fire; but no medical aid was called in, nor the real nature of the mistake discovered, till the following day, and then it was too late for any thing to be done. The child lingered in agony two days, and then death put a period to its sufferings. These facts being proved, the jury returned a verdict of *Accidental Death*, and the coroner severely reprimanded the parties concerned for their great carelessness in dealing with such a dangerous commodity, especially amongst poor and ignorant people. Mr. Withers expressed his sincere regret at what had happened, and pledged himself either to discontinue the sale of poisonous drugs altogether, or to adopt such precautions, in supplying them for the future, as to prevent the possibility of mistake."

THE PATENT PNEUMATIC ENEMA.

This instrument, which has recently been introduced by Messrs. Philp and Whicker*, possesses an advantage over the ordinary pumps, in the uniformity of the pressure, which may be regulated according to circumstances. The liquid is forced through the pipe, not in jerks by the direct action of each stroke of the piston, but by the pressure of the air which is forced into the reservoir, and exercises its elasticity on the surface of the fluid. It is obvious that the force with which the fluid is expelled will depend on the quantity of air which is compressed over it, and this may be varied at will to suit each patient.

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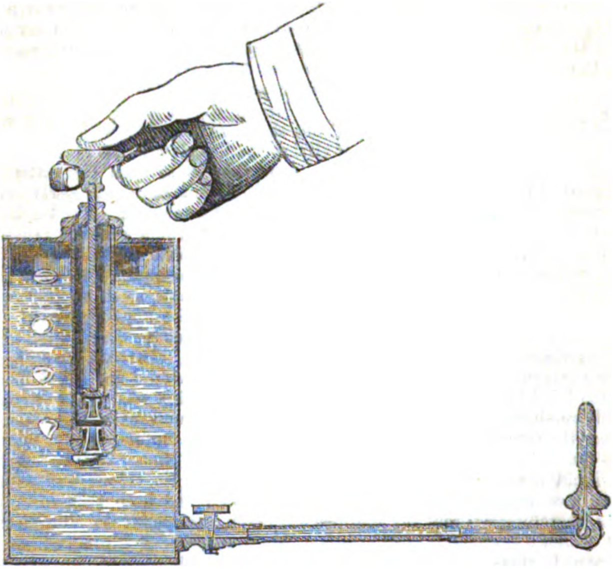
* Late Savigny and Co., St. James's Street.



The following are the directions for using the instrument:—

Screw the tube into the reservoir in the opening situated at the lower part of it, and turn off the stop-cock.

Then unscrew the pump, fill the vessel with the fluid and return the pump, screwing it down tightly.

Open the stop-cock and introduce the pipe.

Raise the piston to the top of the pump and depress it down to the bottom, repeat the same until you have injected the quantity intended, by which means the fluid will be easily administered by a continuing stream Before withdrawing the pipe turn off the stop-cock.

Every action of the pump discharges one ounce, this gives the opportunity of injecting the quantity required by counting the number of strokes.

TO CORRESPONDENTS.

"Fidelitee."—The figures used in *Phillips's Translation of the Pharmacopœia* in describing the crystalline form of salts, &c., are intended to indicate the angles of the faces of the crystals. It is not necessary to commit them to memory.

"An Inexperienced Student."—(1.) The iodo-cyanide of potassium and mercury is a double salt, consisting of iodide of potassium and bicyanide of mercury. If this be added to pure diluted hydrocyanic acid, no decomposition will take place; but if any mineral acid, such as hydrochloric acid, be present, a red precipitate will result, consisting of biniodide of mercury, while chloride of potassium and hydrocyanic acid are at the same time formed.—(2.) The question is one of simple calculation, which our correspondent must be capable of solving for himself. The quantity of moisture present, will, of course, affect the proportions of the other ingredients.—(3.) Ferro-cyanide of potassium and calomel.

"PRUDENTIA."—Fownes's *Manual of Chemistry*, Thomson's or Christison's *Dispensatory*, and Pereira's *Elements of Materia Medica.* Persons passing the Major Examination, are expected to be able to read the Pharmacopœia in Latin.

"A YOUNG MEMBER."—We know of no such work as that described. *Thomson's* or *Christison's Dispensatory* would probably be the nearest approach to it.

M. P. S. states that a person who keeps small fish in a leaden cistern, loses a great number of the fish from a disease which appears principally to attack the osseous or cartilaginous parts, commencing about the tail and extending forwards. [Our correspondent is probably right in ascribing the disease to the influence of lead contained in the water, but we have no experience in any similar cases.

"ERGOT."—For an account of the substance to which the name *Ergotine* has been applied, see vol. iii., page 129. We think in the prescription alluded to, that the term is intended to denote ergot. The dose is much larger than could safely be given if ergotine were employed. The dose of ergotine is from a grain to two grains.

I. A. B.—To make the kréosote mixture, put the mucilage in the mortar, add the kréosote gradually with trituration, and subsequently stir in the water.

F.—We have received the communication.

T. G. E.—We think it probable that the properties of guaiacum are injured by exposure to light.

MR. LAMPLOUGH.—Cinnamon water when distilled from the bark (as we think it ought to be) is rather opaque. It should only contain as much oil as the water will hold in solution.

"AN ASSOCIATE." (York).—Solution of copaiba, see vol. iii., page 66.

"ENQUIRER."—(1.) We think it obvious that the blue pill ought not to have been dissolved in the mixture, and should conclude that in copying the prescription the words "fiat pilula" had been accidentally omitted.—(2.) Ammonia might probably be used for neutralizing chlorine in the process alluded to.

"A YOUNG MEMBER."—Any secret medicine sold with printed directions containing the name of the vendor or proprietor, instructions for use, and recommendation for any particular disorder, is liable to a stamp. It is possible to sail very near the wind and yet evade the law; but we cannot pretend to give instructions in this art.

"AN ASSOCIATE."—See the above.

"ADOLESCENS."—We have never seen a formula for making the Emplastrum Cerati Saponis without colour.

"JUVENIS."—See vol. ii. No. 8. The Minor Examination must be passed in London. The Classical Examination may take place at any part of the country, the examiner being a properly qualified person.

O. P. Q.—They may be obtained of the Publisher, through any bookseller in town or country.

"AMICUS," A. P. S.—Cochl. min., or Cochl. parv., means teaspoonful. Cochl. medium, dessertspoonful.

R. G. (Oxford) need not be alarmed. The observation which has occasioned so much uneasiness in his mind referred to Assistants and Apprentices desirous of joining the Society, not to Associates who joined it at the commencement.

AN ASSOCIATE inquires (1.) Whether there is a good opening for an English Chemist in China? [We have no means of obtaining information on this point].—(2.) Whether a knowledge of the Chinese language would be necessary? [Undoubtedly].—(3.) Whether the business is conducted in the same manner as in England? [We should think not].

A. P. S. does not state whether he had selected the proper time for performing the experiment. This is important in such cases.

"ALGÆ."—Materia Medica.

A. B.—(1.) We answered the question last month.—(2.) We cannot recommend any smaller work as a substitute for the one named.—(3.) Fownes's *Manual of Chemistry*.

J. W.—See Dr. Letheby's *Lecture on Leeches*, vol. iv., pp. 252 and 297. We have no reason to believe that the bite of the green leech is injurious, but it is decidedly inferior in quality to the speckled leech. In times of scarcity, green leeches are often used for want of the better kind.

"TYRO CHEMICUS."—The glaze applied to pottery is not always the same, it usually consists of lead, glass, flints, and sometimes borax and other salts. It would be liable to be acted upon by the acid solution alluded to.

"UNCIAM."—A complicated decomposition ensues on the addition of oil of vitriol to spirit of turpentine.

T. D. (Leeds) inquires what denomination of weights is employed "in the writings in the *Pharmaceutical Journal*?" [In most cases Apothecaries' weight; we believe where otherwise, it is usually specified. If our correspondent will point out any cases in which he is in doubt, we will endeavour to explain them.]

"Χρῶμα."—On adding sulphuric acid to a boiling saturated solution of bichromate of potash, sulphate of potash is formed, and chromic acid set free. If the quantities mentioned be used, there would probably be a deposition of sulphate of potash, coloured with a little chromic acid, or bichromate of potash, as the solution cooled. The solution would still contain sulphate of potash and chromic acid, together with bichromate of potash if the sulphuric acid used was not sufficient to decompose the whole of it. On adding spirit of wine to this solution, a decomposition of the chromic acid is effected, the latter giving up oxygen, and being reduced to the state of oxide of chromium. If there were excess of sulphuric acid present, this oxide of chromium would combine with it, forming sulphate of oxide of chromium. The specimen of salt sent, and which is said to have been deposited from a solution formed as above, is *chrome alum*, a salt having the same constitution as common alum, but in which the alumina is replaced by oxide of chromium. The green powder sent, is a mixture of oxide of chromium and sulphate of potash.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to THE EDITOR, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. V.—NOVEMBER 1st, 1845.

THE CHARACTER OF THE CHEMISTS AND DRUGGISTS.

ALTHOUGH we have always treated with silent contempt those aspersions which are frequently cast upon our body by interested parties or persons unworthy of notice, we think it our duty, when occasion requires, to vindicate the character of our brethren.

We have lately observed in *The Times* several articles in reference to the subject of Medical Reform, in which severe reflections have been cast on the Chemists and Druggists, and we are induced to advert to the subject on account of the sweeping and general nature of the accusations which have been brought against us by a journal enjoying a high character for impartiality and justice.

In this instance, however, we think that justice has scarcely been done to our body, since the observations are founded on the alleged misconduct or incompetence of individuals, for which, under existing circumstances, we contend that the body at large ought not to be held responsible.

It is true that, as the law now stands, every man who has a "doctor's shop," with coloured bottles, is a Chemist and Druggist. The itinerant quack doctors described in our last number are, according to law, Chemists and Druggists. Although they periodically frequent the markets, they have Druggist's shops, and enjoy the same legal protection and privileges as any Member of the Pharmaceutical Society. There are many other persons in different parts of the country, but little if at all higher in the scale of education than the said quack doctors, who sell and compound drugs, and are, in the present imperfect state of the law, to all intents and purposes Chemists and Druggists. Irregularities or improprieties of conduct prevailing among such persons are too often attributed to the class with which they claim connection, and thus the innocent as well as the guilty participate in the discredit, and bear a share of the blame. We are surprised to find that *The Times* has failed to notice the fact, which is now notorious, that the respectable portion of the Chemists and Druggists are uniting and exerting themselves to put an end to the abuses which are a source of complaint. If the public press, instead of running us down, would lend us a helping hand, the completion of the reform would be expedited, and the object sought to be obtained by censure, would be realized by milder and much more effectual means.

We extract the following from the leading article of *The Times* of October 15: it refers to Dr. Lyon Playfair's report of the state of large towns in Lancashire, given in the supplement to the second report of the Health of Towns Commission, and reprobates the prevailing practice of giving opiates to children.

"How a check is to be placed on the vending to the poor and ignorant of drugs with which they may poison their children, unless most stringent restrictions are placed on empiricism of all sorts, it is difficult to say. That the sellers require a check equally with the buyers, is most painfully evident from the evidence which is referred to in the report. Druggist after druggist was examined, who testified to the baneful effects of the practice of quieting infants by narcotics; one after another of them detailed the wretchedness which resulted from that practice; they narrated instances of its shocking consequences; and yet, hardened by custom, without even urging the apology of the starving apothecary in *Romeo and Juliet*, 'my poverty, and not my will consents,' they coolly stated the number of quarts, and even gallons of Godfrey's Cordial, Dalby's Carminative, 'Quietness,' and laudanum, which they sold weekly to the poor in order to enable them to purchase a short respite from their maternal cares at the expense of the health, sanity, and lives of their hapless infants. One druggist, *selling his gallons of opiates weekly*, thus described their effects :—

"'Have you ever known instances in which children have suffered by excessive doses being administered by mothers or nurses?

"'*Oh, yes! I have known death ensue* [the mercenary scoundrel!] and also sleeping for a considerable length of time, so that there was difficulty in getting the child out of the sleep. The deaths in the cases to which I allude, arose from sudden convulsions.

"'Have the children in the habitual use of opiates any peculiarities of appearance?

"'They look very drowsy and low, and seem to be always sleepy. Their eyes are fixed. They become emaciated, their bellies protuberant, and they look very old.'

"Many are the instances of juvenile precocity related, in which a child, from wretched experience can point out the bottle of 'Godfrey' on the druggist's shelf. One druggist says—

"'It is *curious* to see the children in the shop: *they stretch out their little hands, for they know the bottle*, and when they get it, *drink it as eagerly as the drunkard does his glass!*'

"Another of these HERODS gives the following description of the children *drugged at his own shop*:—

"'You may know at once a child who is accustomed to the use of these drugs. It becomes so thin that you can feel nothing but bone. Its eyes get sunken and fixed, its nose pinched; in fact, such children look exactly like little old wizened men and women. They sink off in a decline and die. *I have often reprobated the practice to mothers*, but their answer is, 'What are we to do? it is so very cross.'

"And this, according to the report, is one of a number of 'respectable men!' He had sense enough to reprobate the practice, but his virtue was unequal to the task of refusing to profit by it.

"What a commentary this report affords on free trade in medicine! Custom and pecuniary gain, selfishness in one or other of its forms, renders even 'respectable men'—men of the horse-and-gig respectability—wholly indifferent to the fearful consequences arising from this baneful practice. The evil must be met, for this habitual murder of the innocents is a national degradation no less than a destruction of national power, and to permit it to continue unchecked, especially after its having been brought officially under the notice of the Legislature, would be a national sin."

We readily admit that the practice of dosing children with opiates is very much to be lamented, and are aware that it prevails to a great extent in the manufacturing districts. The subject has often been alluded to in strong terms in this journal. But if we trace the evil to its source, we shall find that the Druggists in general are not such "HERODS" as the Editor of *The Times* would lead us to suppose. It is well known that, from motives of economy, there is a great demand for female labour in the manufactories, and that while the husbands are out of employment, and many of them in the public-houses, the wives leave their infants during the greater part of the day, and with the elder children earn the bread which is to support the whole family. The infants, being neglected, badly fed, or half starved, and living in the polluted atmosphere of small and dirty cottages, are squalid and unhealthy. Their condition before they taste opiates is so wretched, that it becomes a question which is the least of two evils—to allow them to cry all day, and thus exhaust what little strength they have by giving vent to their misery, or to resort to an artificial sedative to allay this terrible state of irritation.

We know that medical men often prescribe opiates as the least of two evils. They are aware that the practice of taking opium is prejudicial; but when they find that the sufferings of a patient are so intense that the constitution is unable to endure them without risk to life, they administer a sedative as a matter of necessity.

In the case of the children, starvation and neglect have reduced them to the lowest degree of misery. With or without opiates, they have but a precarious chance of surviving. Their cries are distressing to their wretched parents, who rush to the nearest druggist for some temporary relief. The respectable druggist (as the report states) represents to the mother the prejudicial consequences of the habitual use of opiates. The mother pleads the urgency of the case, and asks what else she can do? The druggist is sensible of the dilemma, and supplies what is asked for under a protest or precaution, which, in a great measure, if not entirely, releases him from the responsibility. Nevertheless, he is designated as a Herod!

It is possible that some vendors of drugs sell these articles without any precaution, and even encourage the sale of them, from ignorance of their baneful effects, or indifference as to the result. If this be the case, we contend that it is unjust to extend to the whole race the blame which is incurred by certain individuals, who may or may not be entitled to the denomination they assume.

We, therefore, on behalf of our brethren at large, plead not guilty on two grounds: first, because it is not proved that the cachectic and unhealthy condition of the children is occasioned entirely by the opium; on the contrary, there is every reason to believe that most of them are sickly from the time of their birth. Secondly, we contend that a Chemist who is fully entitled to be considered conscientious and respectable, may, *in the emergency of such cases*, feel that he would not be justified in refusing to supply the palliative, provided he sells it with proper precautions; and that if some persons sell it incautiously and indiscriminately, they alone, and not the whole class, are to blame.

We quite agree with the editor of *The Times* in the opinion that the law respecting the practice of Pharmacy in this country is very imperfect, and that some legislative enactment is absolutely necessary to ensure the competence of those who sell and compound poisons and other strong remedies. To remove the existing evils, the regulations of the PHARMACEUTICAL SOCIETY respecting education and examination were established, and for several years our body has been laboriously engaged in bringing this system to a state of completion. The object which the PHARMACEUTICAL SOCIETY has in view, is precisely the same as that which is advocated in *The Times*, and nothing is required for its attainment, but a recognition and confirmation by Act of Parliament of the plans which are now in operation under the auspices of a voluntary but chartered Society.

It would be too much to expect that any legislation, however judicious and complete, could entirely obviate the mischief to which we have been alluding. In spite of all the precautions which may be taken, opiates will be administered, quacks will be patronized, patients will drench themselves with cold water, or trust to the miraculous efficacy of homœopathic globules—some patients will die from their own negligence, others from their own folly; but if the law provides in each department of the profession (including Pharmacy) qualified practitioners who have passed a proper examination, and prohibits the assumption by ignorant persons of titles or offices for which they are unqualified, a great advance will be made in the work of medical reform, the practitioners in each class being subject to such regulations as may be conducive to their professional welfare and character, while ignorant pretenders will be under some sort of control, and liable to punishment in the event of misconduct.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

PHARMACEUTICAL MEETING,
OCTOBER 8, 1845.
MR. MORSON, VICE-PRESIDENT, IN THE CHAIR.

THE CHAIRMAN said, the first business to be brought before the meeting was the distribution of the prizes awarded to the successful competitors at the examinations in the classes of Botany and Organic Chemistry.

DR. A. T. THOMSON in reporting the result of the examination in the CLASS OF BOTANY, said, he had a very similar statement to make this year, to that which he made at the close of the previous session; namely, that the progress of the pupils had been highly satisfactory, and the proficiency evinced by those of them who had competed for the prizes, was very creditable both to them and to the institution. The advantages resulting from the admission of the pupils to the Royal Botanic Garden in the Regent's Park, had, he believed, been fully appreciated by the class, and was abundantly evidenced in the practical examination, all the competitors having given the botanical names and natural orders of nearly the whole of the plants, and there were a large number, which were laid on the table. In the practical examination, for there was both a practical or *vivâ voce*, and a written examination, the relative merits of the competitors was represented in the following order:—

Mr. H. O. HUSKISSON	12
Mr. JOHN ROBINSON ROGERS .	11
Mr. JOS. B. FRENCH	8
Mr. W. HUSKISSON	7

The written questions were as follows:—

1. What is the distinction between the stipule and the bract; the involucrum and the spathe; and how far is each a good distinctive character in descriptive botany? 10

2. Point out the distinctive characters of the *follicle*, the *capsule*, the *legume*, the *silique* and *silicle*, the *drupe*, the *pepo*, and the *berry* 10

3. Describe the more common forms of inflorescence, namely, the *spike*, the *spadix*, the *raceme*, the *catkin*, *strobule*, *umbel*, *corymb*, *cyme*, and *panicle* 15

4. Describe the various parts of the complete flower, and the function which each part performs in the economy of the plant. 20

5. In what part in the natural system will you find the plant described below?—name the *class*, *subclass*, *group*, *alliance*, *order*, *genus*, and *species* to which it belongs:—

Plants, biennial. *Stem* branched, hairy; the hairs soft, long, and each tipped with a minute black gland. *Leaves* sessile, somewhat decurrent, amplexicaul, oblong, acute, sinuated, pale dull green, slightly pubescent like the stem, the long hairs seated chiefly on the midrib. *Flowers* axillary, subsolitary, nearly sessile, seated in the axillæ of the uppermost leaves, but considerably shorter than them. *Calyx* funnel-shaped, somewhat villous; five lobed, regular; each lobe ovate, acute, with an open æstivation; *Corolla* dull yellow, reticulated with purple veins, and the tube deep purple at the orifice; funnel-shaped with a nearly erect limb, which is five-lobed; the lobes rounded, and the two anterior smaller than the others, and separated by a deep slit in the tube. *Stamens* five, declinate, straight, shorter than the corolla, the three lower longer than the others; *filaments* pubescent, inserted about the middle of the tube of the corolla. *Ovary* nearly round, shining, pale green, two-celled, with numerous ovules adhering to the dissepiment. *Style* filiform, declinate, purple at the apex. *Stigma* capitate. *Fruit* an ovate, many-seeded pyxis. Found on waste grounds and commons throughout Europe 30

6. Name the medicinal plants in the order 10

Note.—The numbers to the right indicate the relative values of the questions.

In the answers to these there was a greater difference than had been evinced in the *vivâ voce* examination, and on adding the values of the two sets of answers together, it was found that the order of merit was altered as follows:

First Prize	Mr. ROGERS.
Second Prize	Mr. FRENCH.
First Certificate of Merit	Mr. H. O. HUSKISSON.
Second Certificate of Merit	Mr. WM. HUSKISSON.

Mr. FOWNES reported the result of the examination in the CLASS OF ORGANIC CHEMISTRY. He had always felt much pleasure in testifying to the diligent attention manifested at the lectures, and the proficiency evinced at the examinations, by the pupils of the PHARMACEUTICAL SOCIETY, and on no occasion had he better grounds for such a testimony than that. The examination was conducted entirely in writing, and the following were the questions:—

1. Give a sketch of the general processes for the ultimate analysis of organic bodies, *viz.*, the mode of estimating carbon, hydrogen, and nitrogen, explaining clearly the principles of the operations 100

2. Describe the several varieties of sugar, and give an account of the chief phenomena of fermentation 50

3. Describe the principal compounds and derivatives of ether, and explain as clearly as possible the theory of the production of that body in the ordinary process 50

4. What is meant by the expression "formation of new organic bodies by substitution?" Give examples . . . 50

5. What is the state of the evidence in support of the supposed existence among inorganic substances of bodies really compound playing the part of elements, the organic salt-radicals and salt-basyles? 100

6. Give a notice of cyanogen and its more important compounds, including hydrocyanic acid, with the details of its preparation 50

Note.—The numbers to the right indicate the relative values of the questions.

The answers furnished by the numerous competitors were all good. He had selected four from among these, and thought the writers were all entitled to distinction. He had experienced some difficulty in determining the relative amounts of merit in these four sets of answers. In all that related to practical details, they were all as nearly as possible equal, and it was evident that the writers were well versed in what they described. In the answers to those questions involving theories, there was a greater difference, and it was here principally that he found the means of determining their relative merits; yet he must admit that he still had great difficulty in deciding. The award was as follows:

First Prize	Mr. G. F. SCHACHT.
Second Prize	Mr. B. H. PAUL.
First Certificate of Merit . .	Mr. WM. JOHNSON.
Second Certificate of Merit .	Mr. J. B. FRENCH.

A paper was then read—

ON THE FORMATION OF A NATIONAL PHARMACOPŒIA.

BY MR. SQUIRE.

THE attention of the medical profession has for many years past been directed to the importance of forming a national Pharmacopœia for Great Britain and Ireland. This object was, I believe, contemplated previous to the publication of the last London Pharmacopœia. The evils likely to result from the discrepances which exist in the formulæ of the three Colleges of London, Edinburgh, and Dublin, for preparations bearing the same name, must be apparent to every one. Some of these preparations differ so widely in composition and properties, that the quantity constituting an ordinary dose of a compound, made according to one of the British Pharmacopœias, may be sufficient to prove highly injurious, if not fatal, were the compound prepared from the formula of another of the Colleges. The names of the compounds prescribed by medical men in England, Scotland, and Ireland, are for the most part alike—prescriptions are written in the same language; and similar characters are employed for designating the quantities of the ingredients ordered. There is, in fact, nothing to indicate in what part of the kingdom a prescription has been written; yet such are the increased and daily increasing facilities for locomotion which characterize the present age, that patients are constantly travelling from one capital to another with prescriptions, which, if presented to the Pharmaceutist without explanation, would be dispensed in a manner contrary to the intention of the prescriber.

In bringing this subject under the notice of the Pharmaceutical Society, I propose pointing out some of the principal discrepances which have occurred to me as existing between the three British Pharmacopœias, and I hope that the reading of the paper here, and its subsequent publication among the Transactions of the Society, may elicit the expression of opinions from other practical men, with reference to the points alluded to.

In the remarks I am about to make, I shall follow the order in which the preparations to be noticed occur in the London Pharmacopœia.

Acidum Aceticum.—This name is applied in the London Pharmacopœia to an acid consisting of 30.8 parts of anhydrous acetic acid, and 69.2 parts of water. In the Edinburgh Pharmacopœia, the same name indicates the strongest acetic acid that can be obtained, namely, that containing only one atom, or about fifteen per cent. of water. The acetic acid of the Dublin College contains about 35 per cent. of water. The composition of these three acids, all bearing the same name, may be thus represented:—

	Edinburgh.	Dublin.	London.
Anhydrous Acetic Acid	85	65	31
Water	15	35	69
	100	100	100

Acidum Hydrochloricum Dilutum.—There are considerable discrepancies in the strength of this, as well as of the other diluted mineral acids as prepared according to the instructions of the three Colleges, as the following statements will show:—

	Dublin.	Edin. and Lond.
Hydrochloric Acid	10	5
Water	11	15
	21	20

ACIDUM NITRICUM DILUTUM.

	Dublin.	Edin. and Lond.
Nitric Acid	3	1
Water	4	9
	7	10

ACIDUM SULPHURICUM DILUTUM.

	Dublin.	London.	Edinburgh.
Sulphuric Acid	1	1½	1
Water	7	14½	13

Acidum Hydrocyanicum Dilutum.—This acid, made according to the London Pharmacopœia, contains 2 per cent. of real hydrocyanic acid; that of the Edinburgh Pharmacopœia contains rather more than 3 per cent.; while that of the Dublin Pharmacopœia is necessarily of variable and uncertain strength. In this country Scheele's acid, which contains from 4 to 5 per cent. of real acid, is very frequently prescribed by medical men. These differences in a medicine of such energy and importance are much to be regretted. The strength of the London Pharmacopœia is undoubtedly preferable to the others.

Among the ethereal preparations, there is ordered in the London Pharmacopœia, a compound called *oleum æthereum.* There is no formula for the preparation of this oil in either of the other Pharmacopœias, and the process given by the London College is said by some practical men to be impracticable, or at least to be so uncertain in the product afforded, as to render it very expensive; and it is doubtful whether the substance generally met with under the name of oleum æthereum, is really that which the London College have described.

Spiritus Ætheris Nitrici.—There is a great difference between the strength of the sweet spirit of nitre made according to the London, and that made according to the Edinburgh Pharmacopœia. The latter directs a pure hyponitrous ether to be first made, and then one part of this by measure to be mixed with four parts of rectified spirit. The resulting spirit therefore contains one-fifth of its volume of hyponitrous ether. The process of the London College yields a product which varies considerably in strength, the proportion of ether present depending upon the quantity of ingredients operated upon, and the rapidity with which the distillation is conducted. I have, however, never met with a specimen made according to the London process, that contained half as much ether as that made by the Edinburgh process.

Aconitina is directed in the London Pharmacopœia to be made from Aconitum paniculatum; in the Edinburgh, from Aconitum napellus. Dr. Fleming states that the Aconitum paniculatum contains very little of the alkaloid, and other authors have represented it as being much less active than the species ordered by the Edinburgh College. I believe the Aconitum napellus is generally used.

Liquor Ammoniæ of the London and Edinburgh Pharmacopœias, has a specific gravity .960, and contains 10 per cent. of ammonia; that of the Dublin Pharmacopœia has a specific gravity .950, and contains 12.5 per cent. of ammonia.

Aquæ Destillatæ.—Several of our members have attested to the fact that the distilled waters keep better without the addition of the small quantity of spirit which is directed to be added by each of the Colleges. Mr. R. Phillips many years ago, in his Notes on the Pharmacopœia, pointed out the injurious effect of the spirit in causing the waters to become acid, the spirit being converted into acetic acid. This has also been recently noticed by Mr. Warington in a paper read before the Chemical Society. In the London and Edinburgh Pharmacopœias, the spirit is directed to be added to the ingredients previously to distillation, and it has been stated that the effect of this is to improve the flavour of the product. The Dublin College, however, orders the spirit to be added after the water has been distilled (as did a previous London Pharmacopœia), the object being, no doubt, the preservation of the water, but the contrary effect is certainly produced.

Cataplasma Sinapis.—In the London Pharmacopœia, this is directed to be made by adding boiling vinegar to the powdered linseed and mustard-seed. As this cataplasm is, I presume, intended as a stimulant and rubefacient application, the use of boiling vinegar is obviously objectionable. The rubefacient property of the mustard depends upon the presence of a volatile oil, not originally existing in the mustard seed, but developed by the action of heat and moisture, upon two principles somewhat analogous to the amygdaline and emulsine in the almond. The principle corresponding with the emulsine is, however, coagulated by a high temperature, or by the action of acids, and is then incapable of generating the volatile oil. The stimulating effects of the cataplasm would be more uniformly and successfully produced if the mustard were first mixed with warm water, and the vinegar afterwards added.

Extracta.—In the preparation of extracts from the expressed juices of plants, the London College directs the inspissation to be effected without removing the fæcula; the Edinburgh College, on the other hand, directs the fæcula to be separated, and the filtered juice evaporated. It would be desirable to elicit information from those who have had experience in this class of preparations, and especially to ascertain how far the presence of the fæcula affects the preservation and the properties of the extract. That from liquorice is very properly ordered in the Edinburgh Pharmacopœia to be made from the dried root, and that from the poppy from the unripe capsule.

Infusa.—There is much discrepancy in the formulæ of the several Colleges for the preparation of infusions. Infusum anthemidis is ordered by the London College to macerate for ten minutes; by the Edinburgh College for twenty minutes; and by the Dublin College for twenty-four hours. The Edinburgh College has ordered cold water for making infusum calumbæ, and infusum gentianæ, and in other respects the formula for the latter infusion differs from those of the other Colleges. Again, the London College orders the infusum rosæ compositum to macerate for six hours; Edinburgh four, and Dublin half-an-hour. The infusum digitalis of the Edinburgh Pharmacopœia, is more than twice the strength of that of the London. I have been using for some time an infusion-pot which I contrived, and which answers so well, that I am induced to present one to the Society.*

Liquor Potassæ of the London Pharmacopœia, is described in the notes as being of sp. gr. 1.063; that of the Edinburgh College is directed to be made of sp. gr. 1.072; and that of the Dublin of sp. gr. 1.080.

Alcohol, according to the London Pharmacopœia, consists of 92 parts of absolute alcohol, and 8 parts of water; according to the Dublin Pharmacopœia it contains about 6 per cent. of water, and, according to the Edinburgh, it is, what its name purports, absolute alcohol, or nearly so.

Spiritus Ammoniæ made according to the London process, consists of a solution of *carbonate* of ammonia in spirit; that made according to the Edinburgh process is a stronger solution of *caustic* ammonia in spirit. This discrepancy in the formulæ for spiritus ammoniæ, has sometimes led to a very important difference in the products of another process given in the Edinburgh Pharmacopœia, namely, that for tinctura opii ammoniata. If this tincture be made with the spiritus ammoniæ of the London College, it will contain none of the narcotic property of the opium, whereas, if made with the spiritus ammoniæ of the Edinburgh College, it will be an active and valuable remedy, constituting the Scotch paregoric.

This brings me to the subject of the tinctures generally, the formulæ for which I have drawn up in a way that will readily show the differences existing between the several Pharmacopœias under consideration.

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* They may be had of Mr. Phillips, near the Pantheon, Oxford Street.

TINCT. ALOES.

	London.	Edinburgh.	Dublin.
Aloes powdered............ounce	1	1	1
Ext. Liquorice	3	3	3
Rectified Spirit.	10	12	10
Water	30	28	22
	40	40	32
Digest	14	7	7 days.

Dose—℥ss. to ℥jss.

TINCT. ALOES COMP.

Aloes powdered ....ounces	4	4	3¾
Saffron	2	2	
Tinct. Myrrh	40	40	40
	40	40	40
Digest	14	7	14 days.

Dose—ʒj to ʒij.

TR. AMMONIÆ CO.

Mastich	ʒij.
Oil of Lavender	♏xiv.
" Amber	♏iv.
Rectified Spirit	f℥ix.
Strong solution of Ammonia	20oz.

Dose—♏v. ℈x. to x.

TR. ASAFŒTIDÆ.

Asafœtida	5	5	4
Rectified Spirit	40	40	32
Water			8
	40	40	40
Digest.	14	7	14 days.

Dose—ʒss. to ʒiss.

TINCT. AURANTII.

Orange Peel, dried	3½	3½
Proof Spirit	40	40
Digest	14	7 days.

Dose—ʒij. to ʒiij.

TINCT. BALS. TOLUT.

Balsam Tolu	2	3⅛	2⅛
Rectified Spirit	40	40	40
Dissolve.			

No dose given.

TINCT. BENZOES COMP.

Benzoin	3½	4	3¾
Storax, strained	2½		2½
Aloes	ʒv.	ʒiv.	ʒv.
Balsam Tolu..	1¼		1¼
" Peruvian		2½	
Rectified Spirit	40	40	40
Digest	14	7	7 days.

Dose ʒss. to ʒij.

TINCT. BUCKU.

Bucku leaves		2½	2½
Proof Spirit		20	20
Digest		7	7 days.

TINCT. CALUMBÆ.

	London.	Edinburgh.	Dublin.
Calumba	3	3	3ʒj
Proof Spirit	40	40	40
Digest	14	7	14

Dose ʒj. to ʒiij.

TINCT. CAMPHOR.

Camphor	5	2½	5
Rectified Spirit	40	40	40

TR. CAMPHORÆ CO.

Camphor gr.	50	50	50
Opium, powdered „	72	80	75
Benzoic Acid „	72	80	75
Oil of Aniseed minims	60	60	75
Proof Spirit ounces	40	40	40
Digest	14	7	14 days.

Dose ʒj. to ʒiij.

TR. CANTHARIDIS.

Cantharides, bruised	¼ oz.	½ oz.	½ oz.
Proof Spirit	40	40	48
Digest	14	7	7 days.

Dose ♏x. to ʒj.

TINCT. CAPSICI.

Capsicums, bruised	1¼	1¼	1¼
Proof Spirit	40	40	40
Digest	14	7	14

Dose ♏x. to ʒj.

TINCT. CARDAMOMI.

Cardamoms, bruised	3½	4½	
Proof Spirit	40	40	
Digest	14	7	

Dose ʒj. to ʒij.

Tr. CARDAM. CO.

Cardamoms, bruised	ʒijss	ʒijss	ʒijss
Caraways	ʒijss	ʒijss	ʒijss
Cinnamon	ʒv	ʒv	ʒv
Cochineal	ʒj	ʒj	
Raisins	5oz.	5oz.	
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—ʒj to ʒij.

TINCT. CASCARILLÆ.

Cascarilla, bruised	5	5	5
Proof Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒj. to ʒij.

TINCT. CASSIÆ.

Cassia, bruised		3½	
Proof Spirit		40	
Digest			7 days.

TINCT. CASTOREI.

Castor, powdered	2½	2½	2½
Rectified Spirit	40	40	
Proof Spirit			40
	40	40	40
Digest	14	7	7 days.

Dose—♏xx. to ʒij.

TINCT. CASTOREI AMMONIATA.

	London.	Edinburgh.	Dublin.
Castor, bruised		2½	
Assafœtida		1¼	
Sp. Ammonia		40	
Digest		7	days.

TINCT. CATECHU.

Catechu	3½	3½	3¾
Cinnamon, bruised	2½	2½	2½
Proof Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒj. to ʒiij.

TINCT. CINCHONÆ.

Yellow Bark, bruised	8	8	
Pale Bark			5
Proof Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒj. to ʒiij.

TINCT. CINCHONÆ COMP.

Pale Bark, bruised	4		4
Yellow Bark, bruised		4	
Orange Peel, dried	3	3	1
Serpentaria, bruised	¾	¾	¾
Saffron	¼	¼	¼
Cochineal, powdered	ʒj.	ʒj.	℈iv.
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—ʒj. to ʒiij.

TINCT. CINNAMOMI.

Cinnamon, bruised	3½	3½	4 ʒiij.
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—ʒj. to ʒij.

TINCT. CINNAMOMI COMP.

Cinnamon, bruised	1	1	
Long Pepper, powdered	ʒijss.	ʒiij.	
Cardamoms, bruised	½	1	
Ginger, sliced	ʒiiss.		
Proof Spirit	40	40	
Digest	14	7	days.

Dose—ʒj. to ʒij.

TINCT. COLCHICI.

Colchicum Seeds, bruised	5	5	5
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—♏xx. to ʒss.

TINCT. COLCHICI COMP.

Colchicum Seeds	5		
Sp. Ammon. Arom.	40		
Digest	14		days.

Dose—♏xx. to ʒss.

TINCT. CONII.

	London.	Edinburgh.	Dublin.
Conium Leaves	5 dry.	12 fresh.	5 dry.
Cardamoms, bruised	1	1 ʒj.	2½
Proof Spirit	40	...	40
12oz. Fresh leaves =10oz. water 10oz. Tinct. Cardam.= 3¾oz. water	...	13¾ water	
and 6¼oz. spirit Rectified Spirit 30 oz.	...	36¼ spirit	
	40	50	40
Digest	14	percolate	7 days.

Dose—ʒss. to ʒj.

TINCT. CROCI.

	London.	Edinburgh.	Dublin.
Saffron	...	2	...
Proof Spirit	...	40	...
Digest	...	7	... days.

TINCT. CUBEBÆ.

	London.	Edinburgh.	Dublin.
Cubebs, bruised	5	...	5
Rectified Spirit	40	...	...
Proof Spirit		...	40
Digest	14	...	14 days.

Dose—ʒss. to ʒj.

TINCT. CUSPARIÆ.

	London.	Edinburgh.	Dublin.
Cusparia, bruised	...	4½	2½
Proof Spirit	...	40	40
Digest	...	7	14 days.

TINCT. DIGITALIS.

	London.	Edinburgh.	Dublin.
Digitalis, dried	4	4	5
Proof Spirit	40	40	40
Digest	14	percolate	7 days.

Dose—♏x. to xl.

TINCT. GALBANI.

	London.	Edinburgh.	Dublin.
Galbanum, sliced small	...	—	2½
Proof Spirit	...		40
Digest	...		7 days.

TINCT. GALLÆ.

	London.	Edinburgh.	Dublin.
Galls, bruised	5	5	5
Proof Spirit	40	40	40
Digest	14	percolate	7 days.

No dose.

TINCT. GENTIAN. CO.

	London.	Edinburgh.	Dublin.
Gentian, sliced	2½	2½	2½
Orange Peel, bruised	1¼	1¼	1¼
Cardamoms, bruised	ʒv.	...	ʒv.
Canella Alb.	...	¼	...
Cochineal, bruised	...	ʒss.	...
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—ʒj. to ʒij.

TINCT. GUAIACI.

	London.	Edinburgh.	Dublin.
Guaiacum Resin, bruised	7	7	5
Rectified Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒj. to ʒiij.

TINCT. GUAIACI COMP.

	London.	Edinburgh.	Dublin.
Guaiacum Resin, bruised	7	7	7
Sp. Ammoniæ		40	
" " Aromat	40		42
Digest	14	7	7 days.

Dose—ʒss. to ʒj.

TINCT. HELLEBORI.

Hellebore, bruised	5		5
Proof Spirit	40		40
Digest	14		7 days.

Dose—ʒss. to ʒj.

TINCT. HYOSCYAMI.

Henbane Leaves, dried	5	5	6¼
Proof Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒss. to ʒij.

TINCT. IODINII.

Iodine		10	13 & ℈j.
Rectified Spirit		20	20
Dissolve			

TINCT. IODINII COMP.

Iodine	1		
Iodide of Potassium	2		
Rectified Spirit	40		
Dissolve			

No dose given.

TINCT. JALAPÆ.

Jalap, bruised	10	7	10
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—ʒj. to ℥ss.

TINCT. KINO.

Kino, bruised	3½	3½	3¾
Rectified Spirit	40	40	
Proof Spirit			40
Digest	14	7	7 days.

Dose—ʒj. to ʒij.

TINCT. LACTUCARII.

Lactucarium, in powder		4	
Proof Spirit		40	
Digest		7	days.

TINCT. LOBELIÆ.

Lobelia, dried and bruised		5	
Proof Spirit		40	
Digest		7	days.

TINCT. LOBELIÆ ÆTHEREA.

Lobelia, dried and bruised		5	
Sp. Sulphuric Ether		40	
Digest		7	days.

TINCT. LAVAND. CO.

	London.	Edinburgh.	Dublin.
Sp. Lavender	30	40	32
" Rosemary	10	12	10⅝
Cinnamon	℥iiss.	1	℥ij. & ℈ij.
Nutmegs	℥iiss.	½	℥ij. ℈ij.
Red Sandal Wood	℥v.	℥iij.	℥v. & ℈j.
Cloves		℥ij.	℥j. & ℈j.
	40	52	42⅝
Digest	14	7	10 days.

Dose—℥ss. to ℥ij.

TINCT. LUPULI.

Hop Strobules	6		6¼
" Pollen		5	
Alcohol		40	
Proof Spirit	40		40
Digest	14	percolation	14

Dose—℥ss. to ℥ij.

TINCT. MOSCHI.

Musk, in powder			℥v.
Rectified Spirit		ounces	40
Digest			7 days.

TINCT. MYRRHÆ.

Myrrh, bruised	3	3½	3¾
Rectified Spirit	40	40	10
Proof Spirit			30
	40	40	40
Digest	14	7	7 days.

Dose—℥ss. to ℥j.

TINCT. NUC. VOMICÆ.

Nux Vomica, rasped			10
Rectified Spirit			40
Digest			7 days.

TINCT. OPII.

Opium, powdered	3	3	3 & ℥j.
Proof Spirit	40		40
Rectified Spirit		27	
Water		13½	
	40	40½	40
Digest	14	process	14

Dose—♏x. to ℥j.

TINCT. OPII AMMONIATA.

Opium, sliced		½	
Benzoic Acid		¾	
Saffron		¾	
Oil of Aniseed		℥j.	
Sp. Ammonia		40	
Digest		7	days.

TINCT. QUASSIÆ.

Quassia Wood in chips		1¼	1¼
Proof Spirit		40	40
Digest		7	7 days.

TINCT. QUASSLÆ COMP.

	London.	Edinburgh.	Dublin.	
Quassia, in chips	...	¾	...	
Cardamoms, bruised	...	½	...	
Cochineal, bruised	...	½	...	
Cinnamon, bruised	...	¾	...	
Raisins	...	7	...	
Proof Spirit	...	40	...	
Digest	...	7	...	days.

TINCT. RHEI.

Rhubarb, bruised	...	3½	...	
Cardamoms "	...	½	...	
Proof Spirit	...	40	...	
Digest	...	7	...	days.

TINCT. RHEI COMP.

Rhubarb, sliced	2½	1½	2½
Liquorice, bruised	¾	...	ʒv.
Ginger, sliced	ʒiij.	...	...
Saffron	ʒiij.	...	ʒijss.
Cardamon Seeds, bruised	...	ʒv.	ʒv.
Aloes, bruised	...	ʒvi.	...
Proof Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒij. to ℥iss.

TINCT. RHEI ET GENTIANÆ.

Rhubarb, sliced	...	2	...	
Gentian "	...	½	...	
Proof Spirit	...	40	...	
Digest	...	7	...	days.

TINCT. SCILLÆ.

Squills, dried	5	5	5
Proof Spirit	40	40	40
Digest	14	percolation	7 days.

Dose—♏x. to ʒss.

TINCTURÆ SENNÆ COMP.

Senna	3½	4	3¾
Caraways, bruised	ʒiijss.	ʒv.	ʒiij. gr. XLV.
Cardamoms "	ʒj.	ʒv.	ʒj. gr. XV.
Corianders "	...	1	...
Jalap "	...	ʒvj.	...
Raisins	5	4	...
Sugar	...	2½	...
Proof Spirit	40	40	40
Digest	14	7	14 days.

Dose—ʒij. to ℥j.

TINCT. SERPENTARLÆ.

Serpentary, bruised	3½	3½	3⅜
Cochineal	...	ʒj.	...
Proof Spirit	40	40	40
Digest	14	percolation	7 days.

Dose—ʒj. to ʒiij.

TINCT. VALERIANÆ.

Valerian, bruised	5	5	5
Proof Spirit	40	40	40
Digest	14	7	7

Dose—ʒj. to ʒiij.

TINCT. VALER. COMP.

	London.	Edinburgh.	Dublin.
Valerian, bruised	5	5	5
Sp. Ammon.		40	40
" " Aromat.	40		
Digest	14	7	7 days

Dose—ʒss. to ʒj.

TINCT. ZINGIBERIS.

	London.	Edinburgh.	Dublin.
Ginger, sliced	2½	2¼	3 ʒj.
Rectified Spirit	40	40	40
Digest	14	7	7 days.

Dose—ʒj. to ʒij..

Other instances of discrepances in the formulæ of the three Colleges might be adduced, but those I have already given will suffice for the purpose intended. I now propose directing attention to discrepances of another kind, *not existing among the formulæ of the different Colleges, for preparations bearing the same name,* but among formulæ all contained in the same Pharmacopœia for preparations of the same class. In alluding to these, I shall confine myself to the London Pharmacopœia. Thus, taking, for instance, the formulæ for the diluted acids, we find no uniformity in their relative strengths or saturating powers.

There appears, as far as I can judge, no reason why the liquid diluted acids should not be all of one saturating power (the hydrocyanic being made the exception to the rule). If mixed in the following proportions:—three measures of sulphuric acid and thirty of water, three of nitric acid and fifteen of water, three of muriatic acid, and five of water, they will be found to have severally about the same saturating power as our present diluted sulphuric acid. They might then be accurately adjusted, so that a fluid drachm should exactly saturate twenty-eight grains of crystallized carbonate of soda.

The acetic and phosphoric acids, and any others that may at any future time be introduced into the Pharmacopœia, should be brought to the same strength. The prescriber would thus be relieved from the trouble he must now take in distinguishing between the different strengths of this class of medicines, and the circumstance of the acids being tested as to their saturating power during the process of dilution, would ensure their uniformity.

In considering how far it would be possible to introduce a similar uniformity of strength in other classes of medicines, I have especially directed my attention to the tinctures.

The following quotations from some of our most eminent writers on pharmaceutical subjects, will show that while there is a difference of opinion among them with reference to the value of these preparations in their present form, much of the objection urged against them would be removed if the strength of many of the tinctures were increased; and such increase would be necessary in order to reduce them to one uniform strength, or in other words to equalize the doses.

> "With the exception of those which contain very *active* ingredients, tinctures are not important preparations, and though extensively employed, are not indispensable."—*Brande's Dictionary of Materia Medica*, 1839.
>
> "The form of tincture is one of the best in Pharmacy; for the menstruum is a powerful solvent of the *active* constituents of drugs, it presents them in *small volume*, it preserves them very long unaltered, and it is for the most part a convenient medium for uniting them with other substances in extempore prescriptions."—*Christison's Dispensatory*, 1842.
>
> "Tinctures are not of very extensive use as remedies, except in cases where stimulants are indicated, the solvent even in cases of a few fluid drachms often acting more powerfully on the living system than the principles it holds in solution. When the action of a substance is the reverse of a stimulant, it cannot with propriety be exhibited in this form, unless *the dose be so small* that the operation of the spirit cannot be taken into the account, as in tincture of foxglove, &c."—*Thomson's Dispensatory*, 1844.
>
> "Tinctures are solutions of various substances in spirit of wine of different degrees of strength. The substances which are best adapted for tinctures are those which are *active* in small doses."—*Phillips's Translation of the London Pharmacopœia.*

By adopting the process of percolation in the preparation of tinctures, there would, of course, be no difficulty in effecting the object I allude to, and it would only be necessary to fix upon any one tincture, such as that of opium, or of foxglove, as the standard, and to adjust the strength of all the others, so that their ordinary doses should correspond. On referring to Mr. Phillips's list of doses in his *Translation of the Pharmacopœia*, I find that there are

12 Tinctures, whose maximum dose is fʒj.
13 Ditto " " " fʒij.
11 Ditto " " " fʒiij.

There are three, namely, the compound tinctures of aloes, of rhubarb, and of senna, the doses of which exceed the above.

The fluid alkaline preparations would form another class, the doses of which might be made to assimilate.

I have ventured to make these suggestions for the consideration of those to whom is committed the preparation of our Pharmacopœias, and I trust that the three Colleges will adopt by the commencement of the year 1850 one set of formulæ for the whole kingdom.

Dr. A. T. Thomson thought there could be but one opinion as to the desirableness of having a National Pharmacopœia; or if any thing were required to prove it, Mr. Squire's very excellent statement of the evils likely to result from the present state of things, must tend to remove all doubt on the subject. He feared, however, that there were insuperable difficulties in the way of accomplishing such an object at the present time, nor did he think that the time Mr. Squire had hinted at, would be sufficient to remove those jealousies between the different Colleges which formed the principal impediment to its accomplishment. With regard to Mr. Squire's proposition, so to modify the formulæ as to equalize the doses of medicines of a similar class, he thought this would be impossible, because there were, in fact, no fixed doses of medicines, the quantities to be administered depending on the circumstances under which they are given.

Mr. Squire said, that admitting the correctness of Dr. Thomson's statement respecting the doses of medicines, yet it could not be denied that there were certain quantities recognised as the doses of the medicines alluded to under ordinary circumstances, and he considered there would be a great advantage in arranging the formulæ so that these should be equalized.

The Chairman thought that in some of the cases alluded to by Mr. Squire, such as that of the diluted mineral acids, there could be no objection, and might be much advantage, in so adjusting the strength that they should all have the same saturating power. If the same principle could be carried out with regard to all the preparations, it would certainly be a great assistance to the prescriber.

Mr. Scanlan enquired whether Mr. Squire had directed his attention to the subject of the weights directed to be used in dispensing and preparing medicines. The quantities ordered in all the formulæ in the Pharmacopœias were indicated by Apothecaries' weight; yet it was well known that large weights of this denomination are not generally kept by those engaged in preparing the compounds; the consequence of which is, that avoirdupois instead of Apothecaries' weight is often used without the due allowance being made for the difference between them. He thought there would be a great advantage in the adoption of the avoirdupois or imperial weight by the College, as this is the denomination of weight by which all substances are bought and sold.

Mr. Squire said he was not yet convinced of the desirableness of changing the weights used in preparing and dispensing medicines.

Dr. Ure was very glad that the subject of Mr. Squire's paper had been brought under the notice of the PHARMACEUTICAL SOCIETY. There were many members of that body who could speak practically of the evils likely to result from the discrepances existing between the three British Pharmacopœias, and as these evils affected the health of the public, he thought it quite right that public attention should be directed to the subject. With regard to the weights used in medicine, he would suggest that the most simple method would be to do as was always done by scientific Chemists, namely, to indicate the quantities by the number of grains.

The Chairman wished, before the meeting separated, to direct the attention of the Members and Associates present, to the arrangements made by the Council in reference to the School of Pharmacy for the ensuing season. No expense was spared in providing the best LECTURERS on the subjects taught in the School, and the courses of lectures were made as extensive as the opportunities for attending them, which the pupils possessed, would admit of. The Council had also devoted much attention to the fitting up of a new LABORATORY for the better accommodation of those pupils who were daily engaged in acquiring practical instruction in Pharmaceutical Chemistry. The company present had had an opportunity that evening, of inspecting the new Laboratory, and could therefore judge for themselves of the extent and completeness of the arrangements of this part of the institution. He believed the provisions now made by the Council for affording a complete and efficient course of education to those engaged in the study of Pharmacy, were such as could not fail to meet with general approbation, and gradually to raise and improve the scientific character of the body at large.

Dr. Ure requested permission to say a few words on the subject last alluded to by the Chairman, namely, the NEW LABORATORY of the PHARMACEUTICAL SOCIETY. He had seen many Laboratories intended for similar purposes,—he believed he had seen all those in Germany, including the celebrated one at Giessen, and most of those in France, and he was prepared to assert, that the Laboratory of the PHARMACEUTICAL SOCIETY, was, for its size, superior to any of these. It was better provided with conveniences for conducting the various operations of a laboratory, there was a more convenient distribution and arrangement of apparatus, and it was better ventilated and provided with the means of getting rid of any injurious or offensive vapours, which often proved detrimental to the health of the students. In all these respects, it certainly was the most compact and commodious Laboratory that he had seen.

[NOTE.—We propose giving a detailed description of the new Laboratory in our next number, illustrated with wood-cuts of the furnaces, apparatus, &c., and an account of the course of study pursued by the pupils.—ED.]

ORIGINAL AND EXTRACTED ARTICLES.

VETERINARY PHARMACY.

[*Continued from p.* 122.]

Cathartics (from *καθαιρω, to purge*) are medicines which, taken internally, increase the number of alvine evacuations. Aloes are generally considered the best cathartic medicine for horses, and form the basis of most medicines of this kind.

The variety most in demand for horses is the Barbadoes, this being considered the most uniform and powerful in its action. In the selection of Barbadoes aloes, that kind should be preferred which has a smooth, shining, and conchoidal fracture, and a dark liver colour. When black or friable, it is not so good. The odour is peculiar, and in this respect experience must guide the purchaser in his selection. The value of Barbadoes aloes differs sometimes as much as 50 or 60 per cent., according to the degree in which it possesses the properties above alluded to, and this accounts for the difference in the price charged at different places for horse physic, which is further explained by the fact that Cape aloes are not unfrequently used instead of Barbadoes. We have heard it stated, that Cape aloes act quite as well on horses as any other kind, but this is at variance with the generally received opinion, founded on the experience of those who have practised the veterinary art for many years. The usual dose of Barbadoes aloes is from four drachms to eight drachms, according to the size of the horse, and the circumstances under which it is given. A horse which has just come up from grass requires a smaller dose than one which has been fed on hay and corn. Bran mashes are usually given with advantage before a dose of physic, and the operation is assisted by giving warm gruel, and by moderate walking exercise. When a horse is thus "prepared" for physic, five or six drachms will generally produce as much effect as a much larger quantity without this preparation. The chances of inflammation are also diminished. Violent purging is very prejudicial to horses.

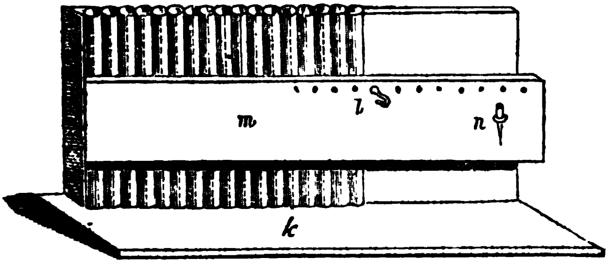
The powder of the croton seed from which the oil has been expressed, is sometimes used as a purgative for horses. The dose is from 15 gr. to ʒss, and it is made into balls with a little treacle and liquorice or linseed meal. The dose of the croton seed in the natural state is from 6 gr. to 12 gr. Authorities differ in opinion respecting the advantage of the methods usually adopted to prevent griping. It is common to add ginger, caraways, or other aromatics to purgative balls, and soap is also added with the view of increasing the solubility of the aloes, and thus promoting its prompt passage through the intestines in the fluid state. Other persons recommend oil as an adjunct to aloes, considering that this shields and lubricates the mucous membrane, and in this way prevents the griping of the purge.

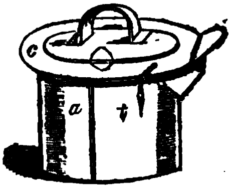
Mr. Bracey Clarke denies the efficacy of these supposed palliatives, observing,—

> "As far as my experience goes, it has not appeared necessary to add to the aloes any aromatic substance or spice, as is often done; for during thirty years that I have administered it simply in the formula given, I never knew a single case of its griping the horse, though I have known it to do so in other hands, where these things have been added; that I believe it is the more likely to do it from such additions, and simplicity of formula is, if nothing forbids it, ever best."

Mr. Clarke has contrived an apparatus for forming the purgative balls which he recommends, and we extract the following description of it from his *Pharmacopœia equina*:—

Apparatus for casting Balls of Aloes.





"*a* is a tin pot with a lid and a low handle on it, that the lid of the saucepan may go over and cover it, into which the aloes is thrown, broken into small pieces. This pot has rather a wide spout, with a valve at its extremity, suspended by a loose hinge, which dropping down falls upon the stream of flowing aloes, and serves to keep the cool air from it, which without this precaution would set and coagulate it; before the entrance of the spout, and within the pot, is placed a wire grate about four inches square, to prevent pieces of gourd and other foreign matters from choking it up. The lid opens by a hinge, and the other side of it is fastened by a pin, *t*, suspended by a small chain: the flange, *c*, of the aloes pot resting on the edge of a common kitchen saucepan used for a water or steam-bath, and into which it is put, and then placed over the fire. Good aloes being selected, smooth and shining, with as little sand, and dirt, or gourd, as may be, or burnt to a friable state, as sometimes is the case; to any given quantity of this add one-fifth by weight of treacle, and place it over the fire; in an hour or more, by keeping the water boiling, the aloes is brought to a fluid state, without any danger of its burning or boiling over, and now and then in the course of this process, but not too often, the lid may be removed, and it may be stirred with a spatula to combine more effectually the treacle with the aloes. When perfectly reduced to a fluid state, the pot is taken out of the saucepan, and it should be, as expeditiously as possible, cast into the tubes of paper, and as in cooling it contracts and sinks considerably, they are again to be filled up. The consistence of these rolls when cold will be found excellent, being solid for handling, yet flexible. The balls are readily formed by simply cutting these rolls into pieces of any length with a buttered knife. An ounce weight is a full and sufficient dose for a large-sized saddle horse or coach horse, if the aloes be good; and ten drams for a cart horse, diminishing the quantity in proportion to the size of the animal. The aloes at present being less adulterated than formerly, a less dosé will be sufficient. At *k*, is a convenient stand for placing the paper pipes in; *m*, a door opening with a hinge to secure them; *n*, a staple and nail to fasten it; *l*, a wire to support the pipes of paper, with holes to accommodate any number of them, or they may be simply stuck upright in a cylindrical gallipot or be placed in bran or meal.

"To make these paper tubes suitably, they should not be formed of hard or stiff paper on account of the throat of the horse: printer's paper, without gum, serves well for this purpose. These tubes are formed by pasting one of the edges, and then rolling them over a cylindrical stick, and to prevent embarrassment from the paste coming in contact with the stick and hindering its being drawn out, the pieces of paper should be cut wide enough, as one circumference and a half, half of the latter serving for paste, and the rest for overplus. Lay these papers tile-fashion, one over another, exposing the edges to be pasted, and one end also extending a little beyond the stick, which is afterwards folded and neatly closed by means of the stick pressed upon the table."

Among the various formulæ which have been adopted, we select the following on the authorities quoted:—

CATHARTIC OR PHYSIC BALLS.

No. 1.

℞ Aloes ℔viij—Olive oil ℔j—Treacle ℔iij. Melt over a water-bath. Dose from ʒvj. to ʒxij. [*Morton.*]

No. 2.

℞ Cape Aloes ʒvj—Croton Oil, grs. v. Mix for a ball. [*Morton.*]

No. 3.

℞ Barbadoes Aloes ʒv—Oil of Caraway grs. x—Palm Oil ʒiij—Ginger ʒss. Mix for a ball. [*Blaine.*]

No. 4.

℞ Barbadoes Aloes ℥viij—Ginger ℥j—Soap ℥j—Treacle q. s. Melt at a moderate heat to form a mass. Dose from ʒv to ʒx. [*J. Bell & Co.*]

CAPSULES FOR COPAIBA AND OTHER NAUSEOUS MEDICINES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

London, 14*th October*, 1845.

SIR,—BEING lately in Paris, I heard of a novel mode of preparing capsules for the envelopement of the nauseous class of medicines, such as balsam of capivi, turpentine, &c. This new capsule is formed of animal membrane instead of gelatine, and has the remarkable property of being pliant and soft in the mouth, easy to swallow, and when in the stomach, of not dissolving there, but of breaking only in passing into the duodenum. The contents of the capsule are thus carried along the intestinal canal into the region where the operation of their curative effects is required. The stomach of the patient, which commonly revolts at the class of medicines referred to, is said to be not at all affected by these capsules, either on their first introduction, or by distressing eructations afterwards. Allow me to ask whether such capsules have been made in England, and whether they would not, for certain diseases, be deemed a great improvement upon those now in common use?

PHARMACIEN.

[Capsules of this kind have lately been introduced in this country, and we believe the above description of them to be very correct. They have not yet been extensively used, but we have heard a favourable report from some medical men who have tried them. We intend in our next number to give a further account of these capsules.—ED.]

ITINERANT QUACK DOCTORS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—I HAVE been exceedingly interested in the perusal of an article upon "Itinerant Quack Doctors," in the October number of your journal. It opens to the general gaze one of those phases of society almost unknown in fact, but most decidedly not devoid of interest and instruction. Making every allowance for the wide-spreading circuit of the "Schoolmaster abroad," and freely acknowledging how extensively the crust of ignorance has been broken up, giving the waters of knowledge thereby free access to a soil parching for the lack of irrigation, we yet feel that credulity is too deeply interwoven with our nature to be wholly eradicated. When disease and its concomitants—pain and anxiety, oppress us, we are ready to try anything. If doubting knowledge fails, ignorant and boastful charlatanry steps in and our hopes credit what our judgment ought to distrust!

"Our *wish* is father to that thought!"

I subjoin a short account of three characters of the genus Quack, that have come under my own observation, thinking it may interest your numerous readers.

About three years since, I had several visits from one of these persons, and a more self-satisfied gentleman I never saw. He generally came for sulphuric and nitric acid. He was a great corn-eradicator, and also removed tumours of all descriptions without the use of the knife. His practice, as far as I could make it out, being to form a circle round the part with a preparation containing both the above acids. This fellow was decently dressed, and used to glide about our corn-market, getting into conversation with different farmers, most probably touching more, however, upon *corns* than *crops!*

Last year another specimen kept a stall nearly opposite my house. He dabbled extensively in worm remedies, and had several bottles containing sundry trophies of his skill before him. Over these, when surrounded by a few rustic auditors, he literally gloated. The fellow had some "gift of the gab," and I doubt not made many of his listeners *fancy* they were troubled with the symptoms he so graphically related; he also sold pills, drops for toothache, &c. The most singular man of this description I ever saw, resides in Colchester, and has been known to me these twenty years. He is now upwards of seventy, and still carries on an extensive practice in syphilitic cases. He is a self-educated man, but many, competent to decide, have assured me they believed that had he been properly educated he would have proved a first-rate mathematician. He is a most able land-measurer, and deeply versed in algebra, but withal a drunken atheistical scamp. He is, apparently, very successful in his pseudo-practice, which is by no means confined to the lower orders; he is constantly attending very respectable people in the neighbourhood, and boasts of curing in "no time" the long-standing cases of half the surgeons in the district; he is perfectly conversant with the opinions and practice of authors of the last century in that peculiar department of medical literature, and has dipped into many of the recent writers upon the same subject, whom, however, he estimates very slightly. A main feature in his treatment is the continued use of the bichloride of mercury, in preference to the chloride.

I fear you may consider I have taken up more space than the subject deserves, but I cannot conclude without one additional observation. Characters like these are, in some measure, created by the demand—

> "For sure the pleasure is as great
> Of being cheated as to cheat."

Ignorant simplicity gazes and stands with open mouth for impudent knowing knavery to circumvent and profit by; and whilst the sight is pitiable to witness, we must also remember it is not unnatural under such circumstances. But what palliation can be offered for those daily degradations practised by professional men for the sake of getting into notoriety? their handbills and advertisements, taken in connexion with their education and station, are more debasing than the Merry Andrew and the trumpet of the itinerant quack doctor.

I remain, Sir, your obedient servant,

Colchester, October 6, 1845. SAMUEL MANTHORPE, M.P.S.

QUACK DOCTORS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—THE observations in the last number of your journal, upon "Itinerant Quack Doctors," appear to call for some remarks. No doubt can be entertained that such injurious practices ought to be rigidly put down, but, unfortunately, no law at present exists, or, I believe, ever has existed, enabling any society or individual to prosecute such persons for *illegal* MEDICAL *practice*.

The College of Physicians possesses no power of the kind, and it is well known that the Society of Apothecaries is restrained by the act of parliament to prosecutions of those who *practise as Apothecaries*; hence this practice by "Quack Doctors," although the most injurious, is left free to every person who has ignorance and presumption enough to carry it out.

The only way by which such parties can be reached, appears to be by indicting them for evasion of the stamp laws, for not attaching a proper stamp to each of their packets of medicine; or by bringing them before the magistrates for committal as rogues and vagabonds.

If, by means of your journal, you can induce the magistrates to act as thus proposed, you would confer a very great advantage upon the country. I remain, Sir, &c. &c.

M. D.

[We fear the plan proposed by our Correspondent would not answer, as the quack doctors put no name or directions on their medicines, but dispense them without even a label, giving verbal instructions. By this means they evade the stamp law. We also doubt whether they could be legally proved to come under the definition suggested.—ED.

METHOD OF FIXING PENCIL AND CHALK DRAWINGS.

FOR pencil drawings, a thin solution of isinglass answers the purpose. It should be allowed to run over the drawing, or very carefully applied with a soft camel's-hair pencil.

For chalk drawings, make a thin solution of size, put it in a flat dish, pass the drawing from one side to the other under the liquid, taking care that the liquid comes in contact with every part of it. The friction of a camel's-hair pencil would injure the drawing. When it is completely wetted fasten it to the edge of a table, or to a string, by means of two or three pins, until dry.

Crayon or charcoal drawings would be spoiled by this process, and for fixing them the paper should be washed over with a solution of size in the first instance. When quite dry, the surface is in a good state for making the drawing; after which it should be inverted, and held horizontally over steam. The steam melts the size which absorbs the charcoal or crayon, and when it has again become dry, the drawing is fixed. This process may be repeated several times during the progress of a drawing, the effect being increased each time.

BRITISH GUANO.

While we have been taxing the birds on the other side of the globe for the guano which they have been for ages accumulating, and while at an enormous expense and labour this commodity has been imported to fertilize the soil of this country, we appear to have overlooked the inexhaustible supply of guano which our own metropolis affords. It is true the subject is occasionally mentioned. We hear it remarked that the present system of conducting the sewers into the Thames, and then drinking the water which holds in solution or suspension the finer particles of excrement from the drains, is not only a waste of property but a disgusting pollution of the crystal stream. The subject is, however, so unpalatable, that we continue to waste the soil and drink the water, endeavouring to forget the existence of a nuisance, which, if it were constantly in our thoughts, would be sickening and intolerable. Thames water is highly recommended, and constantly used, for making tea, beer, or any other beverage which masks its true character, and in which the floating particles of guano are concealed by the colouring matter of the other ingredients; but a person must be thirsty indeed who would drink a tumbler of water as it flows in the Thames through London Bridge.

This pollution of the Thames water is not only quite unnecessary, but a profligate sacrifice of a most valuable commodity. The remedy for the evil, instead of being attended with expense, is likely to become a source of great profit, and we are glad to find that a company is about to be formed, the object of which is to convey the produce of the sewers to the fields and gardens in the vicinity of London, where it may be expected to increase the fertility of the land, and thus augment the supply of food for man and beast. It is proposed to conduct the soil in a fluid state through a series of pipes in the manner adopted by the water companies, and to "distribute the fertilizing fluid over the land, in such manner and proportions as may be best adapted to the various kinds of field and garden cultivation."

It is asserted in the prospectus, that "a careful and moderate calculation has been made of the annual outlay and income, from which it can confidently be stated, that *the undertaking will realize a net profit of at least fifteen per cent.*"

That this is not by any means an exaggerated statement may be inferred from the fact, that the plan has been for many years adopted in Edinburgh with the most signal success, the fertility of the land thus irrigated being increased, in some instances, more than tenfold.

It is computed that the value of the sewerage manure which has been allowed to flow from the metropolis into the Thames is about £1,000,000 annually, while more than that sum has been expended in importing guano from Africa and America.

The use of glass instead of iron for water-pipes has been proposed. If this material should be found to answer, it would be particularly adapted for the liquid guano, which more or less corrodes iron pipes.

INCREASED DUTY ON OPIUM IN INDIA.

The merchants of Bombay have recently addressed a memorial to the East India Company, on the subject of the new duty on opium. In January, 1844, they addressed a similar memorial, complaining of an increase which had been imposed, at about three weeks' notice, in October, 1843, thus occasioning great loss to the dealers in opium, in the completion of their contracts. No answer was returned to this address, but a further increase has recently been made, a notification of which appeared in the *Bombay Gazette* of August 13th, to the effect that it would be raised after the 1st of October, to 300 rupees per chest.

It appears from the statement made by the merchants, that they have sustained various losses within the last two or three years, on account of this advance.

MEDICAL HISTORY AND CHEMICAL EXAMINATION OF CASCARILLA.

BY M. DUVAL.

Most of the substances of any importance among our materia medica, have been examined by Chemists, and their natures are at present more or less known ; yet among those which are not, or which are but imperfectly, there is one which appears to me worthy of such an examination, both on account of the reputation which it has enjoyed at certain times, and from the services it may yet render to medicine—I speak of Cascarilla.

We shall find, I think, a justification of my proposition in the historical account with which I shall precede the description of the analysis of this substance as well as in the analysis itself.

According to M. Alibert, it is to Vincent Garcias-Salat, a learned Spaniard, that the credit is due of having first mentioned this bark, the effects of which he studied in tertian fever, in a dissertation entitled *Unica quæstiuncula in quâ examinatur pulvis de quarango vulgò Cascarillâ in curatione tertianæ.* 4to, Valentiæ, 1692.

The German Professor, Jean Andrè Stisser, gave more extended information respecting this bark : he recommended its being smoked with tobacco, the poisonous and narcotic effects of which, he stated, it corrected. (*Acta Laboratorii Chimici*, specimen 2. Helmstadii, 1693.

In 1695 J. L. Apinus, a celebrated physician and professor at Altorf, confirmed the growing reputation of this remedy, by the successful employment of it which he made in the treatment of the fevers which devastated the town of Herspruck and its environs.

Nevertheless, the first documents which are found on this subject in French works, date no earlier than 1719. They are contained in the history of the Academy of Sciences.

In 1733 Bœhmer (Philippe Adolphe) made this bark the subject of a thesis, entitled *De Cortice Cascarillæ ejusque insignibus in Medicinâ Viribus. Dissert. inaug. præs.* Fresd. Hoffmann, in 4° Halæ.

The cascarilla plant, a figure of which he gives, is designated by the name of *Ricinoides elæagnifolia* (Tournfort).

It was first attributed by Linnæus to the *Clutia eleuteria* (*Croton eleuteria*, 888), fig. Hort. Cliff. 486. A large shrub of the class and order Monœcia monadelphia, growing in the Lucca islands and the Antilles.

Linnæus afterwards thought that it was produced by the *Croton cascarilla* (fig. fl. Sciences Méd.), a small shrub growing in the above islands, and especially at St. Domingo (*Croton cascarilla, foliis lanceolatis, acutis, integerrimis, petiolatis, subtus tomentosis, caule arboreo*), Linn. class 21.—Juss. class 15, ord. 1, *Euphorbiaceæ*.

"This explains," says M. Fée, "why, in works on Materia Medica, the cascarilla of commerce is attributed sometimes to one or the other of these shrubs, and sometimes to both."

But M. Guibourt goes still further. "At the present time," he says, "not only are opinions divided between these two species, but on account of the difference which exists in the barks as met with in commerce, it has been questioned whether it may not be produced by other species, such as, *Croton lineare, humile, balsamiferum, thuriferum, coriaceum, populifolium, &c.*"

However this may be, it is quite certain that the *Croton cascarilla* furnishes some of the cascarilla of commerce. M. Poiteau has observed this plant at Saint Domingo. "It is one of those plants," says M. Turpin, "which lives in societies, as, in the animal kingdom, do the ants and the bees. It grows best in dry places, barren and exposed to the winds. In such localities it forms of itself forests of many leagues in extent—in the vicinity of Port-du-Paix, and on the borders of the sea between Monte Christi and Cape Lagrange."

An agreeable odour is exhaled from every part of the cascarilla plant. A beverage is made from the leaves, which has an agreeable taste and odour, and which the inhabitants of St. Domingo use under the name of Port-du-Paix tea. The shrub itself is called in St. Domingo Port-du-paix sage.

But in a Pharmacological point of view, it is the bark alone that we are interested in. This bark, called *Cascarilla*, from the Spanish word *cascara*, signifying bark, and the diminutive of which is *Cascarilla*, has also been called *chacril* or *chacrille quinquina aromatique*, and eleutherienne bark, from Eleuthera, one of the numerous Lucca islands.

M. Guibourt has described three sorts; namely, the true or officinal cascarilla, the whitish cascarilla, and the reddish or terebinthinate cascarilla; but this last is not commonly met with in commerce.

M. Guibourt informs us that the whitish cascarilla always retains its epidermis. This certainly is generally the case. Nevertheless, I have frequently seen barks in commerce which were deprived of the epidermis, and I observed that in this state they presented transverse fissures, whilst the true cascarilla, thus stripped, shows, on the contrary, longitudinal lines. This character appears to me to be constant.

In other respects, the description of cascarilla, such as it has been given us by M. Guibourt, is the most exact and complete that I know.

Medical Properties.—We read in the *Memoires de l'Acad. des Sciences*, 1719, "That at the time when the cinchona bark was scarce in France, the chacril (cascarilla) was employed with success in intermittent fevers. This febrifuge has this advantage, that it operates in smaller doses, and does not require to be continued so long."

Stahl, physician to the King of Prussia, has extended its use to pleurisy. It is of great use in cases where it is required to augment perspiration.

But M. Boulduc considered it to be of the greatest utility in the dysenteries of 1719, whether accompanied with fever or not. Ipecacuanha almost fell into disrepute, and cascarilla acquired high reputation.

According to M. Alibert, Cullen, who endeavoured to combat the exaggerated ideas of the German doctors, treated this remedy with much injustice and disdain. According to this skilful practitioner, the best method of administering cascarilla, is to mix it with cinchona, the efficacy of which it increases, and he adds that M. Pinel has successfully used such a mixture in the hospital of Salpêtrière.

To sum up the virtues of this bark, according to M. Orfila: it is employed with success as a febrifuge in cases where cinchona is indicated. It is used in diarrhœas, chronic dysenteries, and hectic fevers; it is also administered as a vermifuge.

Chemistry of Cascarilla.—Boulduc informs us that cascarilla yields to spirit a larger amount of resinous extract than any other known vegetable. One ounce afforded him five gros (295 troy grains), having a bitter and sharp and aromatic taste and purple colour. There are no vegetables known, says he, yielding so much extract. The dried marc weighed three gros (177 troy grains) and consisted only of the earthy and fixed part of the cascarilla.

Bœhmer, in an inaugural thesis already alluded to, states that he procured, by the distillation of a pound of the bark, an odorous distilled water, on which floated an ethereal volatile oil, of a penetrating smell and greenish colour. He further obtained three ounces of resin, besides a large quantity of extract; and there remained seven ounces of earthy residue. He represents cascarilla to contain:—An ethereal volatile oil—A resin, to which he attributes the principal virtues of the bark—A gummy matter—Fixed earthy matter—Alkaline salts.

He also says that cascarilla in powder, submitted to dry distillation, yielded him an acid phlegm, on which floated two drachms of a volatile oil, resembling that of hartshorn.

The analysis of Tromsdorf, of 1797, is given in the *Annales de Chemie*, vol. xxii., p. 219.

"Eight ounces of cascarilla," says he, "furnished me, on analysis,

Mucilage and bitter principle......	1 ounce, 4 gros.
Resin....................................	1 ounce, 1 gros, 40 grains.
Volatile oil	1 gros, 8 grains.
Fibrous part	5 ounces, 2 gros.
Water	48 grains."

It is easy to see that these analyses, although in accordance with the state of science at the respective periods at which they were made, are by no means satisfactory at the present time.

Several celebrated therapeutists have expressed a wish that the chemical examination of this bark should be made in accordance with the present advanced state of knowledge.

It must, however, be stated, that two very able and well-known Chemists have in our day, directed their attention to cascarilla. In the fifth edition of Alibert's *Traité de Therapeutique*, we find the following:—

"Several Chemists have occupied themselves with the study of cascarilla, but none have succeeded in giving an exact idea of the nature of this bark. MM. Caventou and Felix Cadet undertook a new investigation of this subject, and after a great number of experiments, succeeded in being able to state that no analogy existed between the composition of cinchona and this substance, so much vaunted for the cure of intermittent fevers; that this last contains, above all, a large quantity of a substance which at first sight might be taken for a resin, but which differs from it in many respects; thus this pretended resin is very soluble in alcohol, and but slightly so in ether; it also dissolves in water. The solution has a strong aromatic bitterness, almost nauseous; it does not crystallize. This pretended resin, which may be called cascarilline, is neutral to litmus; it appears to possess an electro-positive property in relation to salifiable bases. Thus on boiling it in water with caustic magnesia, lime, potash, &c., it dissolves in large quantities by the aid of these bases; but if an acid is added to these liquid combinations, the base is saturated, and at the same time the eliminated cascarilline is precipitated in the form of grayish flakes. Nitric acid possesses the property of slightly reddening and dissolving the cascarilline. The properties of this product remain to be determined by chemical examination. The property possessed by cascarilla of perfuming the air when burnt with tobacco, appears to depend on the volatile oil of the bark, and also on the benzoic acid found in the fatty matter extracted by ether."

MM. Caventou and Cadet, although they have added some notions to those which existed before as to the chemical nature of this bark, have, nevertheless, not obtained the active principle in a state of purity. These Chemists appear to have occupied themselves principally in the examination of cascarilla, with a view to the detection of a vegetable alkaloid. It cannot be doubted, from their well-known skill, that they would have perfectly isolated the active principle of the bark, had they seriously directed their attention to that point.

The Analysis.—The following are the principles which I have found in commercial cascarilla:—

1. Albumen.
2. Tannin of a particular nature.
3. A bitter crystallizable matter (cascarilline).
4. A red colouring matter.
5. A fatty matter, with a nauseous smell.
6. Wax.
7. Gummy matter.
8. A volatile oil, with an agreeable smell.
9. Resin.
10. Starch.
11. Pectic acid.
12. Chloride of potassium
13. Salts of lime.
14. Woody fibre.

But of these various ingredients, that which appeared to me to possess the greatest interest, was the bitter matter. This is the process I follow for extracting it:—I commence by choosing a cascarilla possessing a very decided bitter flavour. The cascarilla, in gross powder, is introduced into a displacement apparatus, and treated with water. To the mixed liquors a solution of acetate of lead is added; it is then filtered, and the excess of lead separated by sulphuretted hydrogen. It is again to be filtered, and evaporated to about two-thirds; a little animal charcoal is then added, and it is again filtered. The evaporation is to be continued, the temperature being kept as low as possible. A pellicle will ultimately appear. When it has acquired a certain consistence, and before the liquid has become syrupy, it is to be allowed to cool, and the solid matter removed with care. Sometimes, however, this substance does not present any crystalline character, and it then has a resinous appearance, and the greater part of it is attached to the sides of the evaporating vessel. It becomes hard on cooling.

To purify either of these substances, they are to be powdered, and introduced into a tube with rather more than is required to moisten the powder of cold spirit of sp. gr. .866. After remaining in contact for a sufficient length of time, the alcoholic liquid, which will be of a dark colour, is to be drawn off. By this means, the greater part of the colouring and fatty matters, with which the cascarilline is contaminated, will be removed. The remaining powder will be sensibly decolourized. It is now to be dissolved in boiling spirit of sp. gr. .832; a small quantity of animal charcoal is to be added, then filtered, and allowed to evaporate spontaneously. The residue is to be dried on filtering paper. To complete its purification, powder it, and wash it again with cold spirit; redissolve it in boiling alcohol, filter, and leave it to spontaneous evaporation, when the bitter matter will be obtained in a state of purity.

Properties.—Thus obtained, it is white and crystalline. The crystals examined by the microscope have, usually, the form of prismatic needles; sometimes, also, that of hexagonal plates. It is inodourous, has a bitter flavour, but this flavour does not manifest itself immediately, which is accounted for by its sparing solubility in water. Heated in a small tube closed at one end, it melts into a liquid, having the appearance of a yellow syrupy caramel. Its fusing point is lower than that of salicine. Thus fused, if allowed to cool, it retains its transparency, and becomes brittle like resin; if, on the contrary, the heat be continued, it undergoes decomposition, disengaging a vapour which reddens litmus.

Triturated with a small quantity of potash and heated in a tube so as to decompose it, it does not restore the colour of reddened litmus.

Heated on a piece of platinum foil, it burns without leaving any residue.

Cascarilline is very little soluble in water; yet it communicates to the liquid a powerful bitterness. The solution is neutral to litmus. It is not precipitated by neutral or basic acetate of lead, nor by tannin, or alkalies. It is soluble in spirit and ether.

The effects of the concentrated mineral acids deserve attention. Thus, concentrated sulphuric acid attacks it cold, dissolves it, and it instantly becomes of a deep red colour, approaching to purple. The addition of a little water occasions a precipitate. The liquor then assumes a grass-green colour, more or less deep, according to the quantity of water added; but as the precipitate collects, the liquor becomes decolourized, the precipitate alone retaining the green colour. Ammonia, even in excess, does not redissolve this precipitate, but changes the colour to that of yellow ochre.

Concentrated nitric acid also dissolves it. The solution which is yellow, is precipitated by ammonia, which in excess does not dissolve the precipitate.

Hydrochloric acid also dissolves it, assuming a violet tint, which the addition of a small quantity of water changes to blue. But on the addition of a larger quantity of water, this again passes to green.

We have seen that the cascarilline does not contain nitrogen, it has no action on litmus, and does not combine with bases or acids. It ought then to be classed among the non-azotized neutral substances, with salicine, &c.

The intensity of the bitter flavour of cascarilline, and the analogy which has been observed between the properties of cascarilla and cinchona, justify the expectation that medical science may be benefited from the use of the substance which I have isolated.—*Journal de Pharmacie.*

ON DIGITALINE.

The discovery of the active principle of digitalis by M. Homolle, has induced M. O. Henry to lay claim to the credit of having, ten years ago, proposed the use of tannin for obtaining some organic products.

He has suggested some modifications in M. Homolle's process, by which digitaline may be obtained more quickly, and in larger quantity. These modifications are as follows:—

Take any quantity of dry digitalis, reduce it to coarse powder, and form it into a paste with spirit, of sp. gr. .860; separate the tincture by strong pressure, and repeat the operation a second time.

The alcoholic liquor is to be distilled, and the residue treated with a certain quantity of water acidulated with acetic acid; filter or decant, and add to the clear liquor a concentrated infusion of nutgalls as long as any precipitate is formed. It is necessary that the liquor should be slightly acidulated. The deposit will collect into a flocculent precipitate, adhering to the bottom of the vessel like a resin; it is to be collected with care, and well triturated with an equal weight of very finely powdered litharge, adding a little alcohol to dilute it.

The tannate of lead formed is to be treated with rectified spirit, sp. gr. .840, at a gentle heat of from 86° to 104° Fahr. It is then to be filtered, distilled, and the residue shaken two or three times with warm sulphuric ether. The insoluble part is digitaline, which is excessively bitter, scarcely soluble in water, very soluble in spirit, occasions sneezing when reduced to powder; heated it melts, and may be drawn into long threads, of a pearly appearance; cooled, it is easily reduced to a yellowish white powder, which must be kept from air and light.

It may also be dissolved in spirit, and spread on plates of glass, tin, earthenware, &c.; it will dry, and separate in beautiful white scales.—*Journal de Chemie Médicale.*

ON THE CONSTITUTION OF BEBEERINE.

BY DOUGLAS MACLAGAN, M.D., F.R.S.E.,

AND

THOMAS G. TILLEY, ESQ.

Professor of Chemistry in the Queen's College, Birmingham*.

Bebeerine is the name given by Dr. Rodie, of Demerara, to an organic base, of which he pointed out the existence in the bark of a tree of that colony, known by the name of *Bebeeru* or *Green Heart.* This tree has recently been examined botanically by Sir Robert Schomburgk, and found to be a species of *Nectandra*, which in compliment to Dr. Rodie, he has named *N. Rodiei* (*Hooker's London Journal of Botany*, December, 1844).

The general properties of the alkali, and the preparation of its sulphate for medicinal use were further described by one of us in a paper read before the Royal Society of Edinburgh, in April 1843 (*Transactions*, vol. xv. part iii). In this memoir an account was given of the preparation of bebeerine, in what was regarded as a state of chemical purity, and of its separation by means of æther from what was believed to be another alkaline matter, sipeerine; but as the substance is neither crystallizable nor colourless, it could not decidedly be affirmed to be chemically pure until its constitution had been determined by ultimate analysis. This desideratum it is proposed to supply in the present paper.

The chief difficulty in preparing the pure alkali arose from the troublesome process required to free it from adhering tannin, considerable loss being experienced in the methods then adopted. This has subsequently been accomplished with greater facility by the following process, which may be applicable to the purification of other organic bases.

The sulphate prepared for medicinal use, which is always more or less impure, is precipitated by ammonia; and the alkaline matter thus separated, is, after washing with water, triturated with about an equal weight of freshly precipitated and moist hydrated oxide of lead. The magma thus formed is then dried over the water-bath, and the alkali is taken up by absolute alcohol. On distilling off the spirit, the organic base is left in the form of a transparent orange-yellow resinous mass, as described in the paper above quoted. This, on being dried, pulverized, and treated with successive portions of pure æther, is in great part dissolved in this fluid. The dissolved portion, on distilling off the æther, is obtained in the form of a translucent, amorphous, but homogeneous resinous-looking substance, of a pale yellow colour, and possessed of all the properties of an organic alkali. This is pure bebeerine, as described in April 1843.

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* Communicated by the authors.

Bebeerine thus obtained does not crystallize. It is very soluble in alcohol, less so in ether, and very sparingly in water. Heated, it fuses; and the heat being continued, it swells up, giving off vapours of a strong peculiar odour, and burns without residue. Subjected to the action of oxidizing agents, it gives with bichromate of potash and sulphuric acid, a black, and with nitric acid a yellow resin. It forms with acids salts which are all uncrystallizable; with perchloride of gold, mercury, copper, iron and platinum, it gives precipitates which are soluble to a certain extent in hot water and alcohol, but which on the solution cooling, are not deposited from it in a crystalline form[*].

To ascertain the composition of the base, two portions of it, prepared at separate times, were subjected to combustion.

(1.) 3.300 grms. substance gave 0.179 water, and 0.788 carbonic acid.
(2.) 0.3505 substance gave 0.1965 water, and 0.922 carbonic acid.
(3.) 0.350 substance gave 0.2095 water, and 0.914 carbonic acid.

Nitrogen was estimated by Will and Varrentrapp's method.

(1.) 0.4030 substance gave 0.3490 ammonio-chloride of platinum.
(2.) 0.417 substance gave 0.1175 platinum.

These numbers lead to the following per-centage proportions, the atomic weight of carbon being taken at 75.85.

	I.	II.	III.	Mean.
Carbon	72.22	71.75	71.80	71.92
Hydrogen	6.62	6.22	6.64	6.49
Nitrogen	5.49	4.02	—	4.75
Oxygen	15.67	18.01	—	16.84
	100.00	100.00		100.00

The combination with chloride of platinum was made use of to determine the atomic weight of the base.

(1.) 0.6380 salt gave 0.1215 platinum = 19.04 per cent.
(2.) 0.6250 salt gave 0.1200 platinum = 19.28 per cent.
(3.) 0.5335 gave 0.1080 platinum = 20.20 per cent.

The platinum salt was burned with chromate of lead.

0.4005 salt gave 0.152 water and 0.6232 carbonic acid.

For nitrogen.—0.430 salt gave 0.177 ammonio-chloride of platinum.

Chlorine was estimated by heating with lime, dissolving in nitric acid, and precipitating by nitrate of silver.

0.420 salt gave 0.3730 chloride of silver.

[†] When precipitated by ammonia from its solution in acids, it is obtained in the form of a very pale yellow powder. This was examined with a view to determine whether or not it was a hydrate of the alkali. It was washed, dried *in vacuo* over sulphuric acid, and heated in an oil-bath. At 108° Fahr. it began to soften, and at 370° it fused into a transparent brown resinous mass. It did not sensibly lose weight during the process, and had undergone no change in properties from exposure to this temperature, as it retained its perfect solubility in acids, and formed with them the usual bright yellow solution.

These numbers lead to the following formulæ :—

	I.		II.		III.
Carbon	42.69	......	—	......	—
Hydrogen	4.21	......	—	......	—
Nitrogen	2.61	......	—	......	—
Oxygen	10.36	......	—	......	—
Platinum	19.04	......	19.24	......	20.24
Chlorine	21.09	......	—	......	—
	100.00				

	I.	II.	III.	Atoms	Calculated per cent.
Carbon	42.69	—	—	35=2654.76	42.43
Hydrogen	4.21	—	—	42= 262.07	4.18
Nitrogen	2.61	—	—	2= 177.04	2.83
Oxygen	10.36	—	—	6= 600.00	9.59
Platinum	19.04	19.24	20.24	1=1233.30	19.73
Chlorine	21.09	—	—	6=1328.00	21.23
	100.00			6255.17	99.99

The atomic weight calculated from the quantity of platinum found, is—

I. 6476.0
II. 6423.4
III. 6092.2

$$\frac{18991.6}{3} = 6330.2$$ mean found atomic weight of platinum salt.

Referring to our previous numbers, we find—

	Atoms.	Calculated per cent.	Mean found.
Carbon	35=2654.75	72.11	71.92
Hydrogen	40= 249.59	6.77	6.49
Nitrogen	2= 177.04	4.82	4.75
Oxygen	6= 600.00	16.30	16.84
	3681.38	100.00	100.00

On comparing these calculated and found numbers, they will be seen to agree, and on subtracting the weight of one atom of chloride of platinum and hydrochloric acid from the atomic weight of the platinum salt of bebeerine, we find

$PtCl_4$	2118.30	6330.20	1 atom platinum salt
HCl	455.13	2573.43	1 atom $PtCl_4 + HCl$
	2573.43	3756.77	atomic weight of bebeerine

which is a close approximation to the found numbers. The rational formula for bebeerine then is

$$C_{35} H_{40} N_2 O_6.$$

It appears to have been sufficiently established by the experience of medical practitioners, that bebeerine possesses marked properties as a remedy for periodic diseases (Maclagan, *Edinburgh Medical and Surgical Journal*, April 1845).

On comparing its composition with that of other vegetable alkalies possessed of similar remedial powers, such as quinine and cinchonine, it is not a little remarkable that it differs from them in atomic constitution, and that it is isomeric with morphia, which acts as a pure narcotic. The atomic constitution of morphia, calculated from the formulæ deduced by Liebig and Regnault from their analyses, agrees perfectly with that given above for bebeerine. The composition of the two bases is, in fact, identical.

This is the first instance of isomerism occurring in substances belonging to the class of organic bases.

One very interesting conclusion regarding the action of medicinal substances appears to be deducible from these results, that similarity of physiological properties does not depend upon similarity in the proportions of their constituents. It seems probable that the mode in which their atoms are grouped has an important share in modifying their physiological actions; for in the present instance we have the same number of atoms both in morphia and bebeerine, but in the one producing a white crystalline body of narcotic qualities, in the other a yellow amorphous resinous-looking substance, acting as an anti-periodic. The differcnce in their physical properties in fact proves that their elements are differently arranged.

We have not been enabled to examine *sipeerine*, the substance left behind when pure bebeerine is dissolved out by means of æther. It occurs in very minute quantity, and requires a very tedious repetition of the treatment with æther to free it from the last traces of bebeerine. There seems, from some trials which we have made, good ground for believing that it is a distinct alkali, but it has not been obtained in sufficient quantity to enable it to be subjected to ultimate analysis.—*Proceedings of the Chemical Society.*

ON THE PROPERTY POSSESSED BY LITHARGE IN FUSION OF DISSOLVING OXYGEN;

And on some Circumstances accompanying the Production of Litharge in the Process of Cupellation on the large scale.

BY M. F. LEBLANC.

It is known that the process of cupellation, as performed in lead works, consists in separating silver from the lead, the latter metal being eliminated in the state of oxide. Cupellation on the large scale, or refinery, as it is called in some works, differs from the process as performed in the assayers' laboratory, inasmuch as the litharge, or protoxide of lead, formed by the action of atmosperic oxygen on the fused lead at a high temperature, instead of being separated by absorption into the substance of the cupel, is removed from the furnace as it is formed, by means of a trench on a level with the bed of the furnace. This is the mode of producing litharge. The material of which the furnace is formed ought to be such as to prevent absorption and resist the solvent action of the fused litharge.

The atmospheric oxygen is projected on to the surface of the fused metal by a forced current of air.

During a stay I recently made at Poullaouen, I assisted in several operations for refining lead containing silver, and made some observations which may not, perhaps, be devoid of scientific interest.

It is known that litharge, to be adapted for commerce, should possess certain properties, which can, to a certain extent, be developed at will, by properly regulating the rapidity of the cooling of the litharge which flows from the furnace. Litharge, when cooled rapidly, is yellow or greenish-yellow; but when cooled slowly, in the manner indicated by M. Fournet, it changes structure and colour, and acquires those properties which make it generally esteemed in commerce.

It is to the study of the physical and chemical changes which take place during this transformation, that I have directed my attention. With this view I have performed some experiments which I am about to describe, and which, I think, will modify the opinion previously formed of these phenomena.

M. Fournet admits that the fused litharge may absorb the oxygen, and become superoxidized, and that at a higher temperature than that at which minium is decomposed. This Chemist considers that the red litharge, sought in commerce, owes its properties to an excess of oxygen.

M. Fournet's opinion has not been adopted by M. Thénard. This illustrious Chemist has repudiated the theory of the superoxidation of the lead at the temperature of the cupelling furnace, and considers it as possible that a solution of oxygen is effected in the litharge, similar to that which occurs in the case of fused silver. This oxygen will unite with the protoxide of lead when slowly cooled, and will be disengaged if rapidly cooled.

M. Pernolet, director of mines and works at Poullaouen and Huelgoat, had already remarked that the fused litharge held a gas in solution, varying in quantities according to the duration of the operation, and that this gas had a tendency to escape at the moment of solidification. The facilities he was good enough to afford me, enabled me carefully to collect specimens of litharge of different degrees of purity, and in different states: I also collected and analysed the gas as it escaped. These experiments fully confirm the anticipations of M. Thénard, as regards the solution of the oxygen; for the collected gas possesses the properties of oxygen nearly pure. The analysis indicated from 82 to 90 per cent. of oxygen. It is probable that the presence of a little nitrogen may be due to the accidental admixture of a small quantity of air. In fact, on repeating the experiment under similar circumstances, with silver taken from the refiners' cupel, I did not find above 90 per cent. of oxygen absorbable by heated phosphorus.

The quantity of oxygen dissolved in a given weight of litharge, is too great to admit of the possibility of silver contained in the litharge being the solvent of the gas; this proportion is not less than nineteen and a half cubic inches of the gas to 2lbs. 3ozs. avoirdupois of litharge, notwithstanding the necessary losses in its collection. But the specimens of litharge operated upon, even those most rich in silver, did not contain more than the one-thousandth, or fifteen-hundredth of that metal.

It appears to me then established, that the litharge, inoxidizable at the temperature of the furnace, may, under the influence of a current of air, dissolve oxygen in the same manner as silver, and that it comports itself as most liquids do when in contact with gases.

Black or impure litharge, is, according to my experiments, unfit for solving gases; at least the quantities found were so small, that their presence might be considered as accidental; analysis also, indicated the proportions of oxygen and nitrogen to be the same as in atmospheric air. This circumstance will not appear surprising, when it is considered that this kind of litharge contains the elements of oxidizable sulphurets.

Ought the solution of oxygen in a liquid, in a state of igneous fusion, and which has no chemical action on the gas, to be considered as a general phenomenon, or confined to the cases of litharge and silver? This is a question which my experiments may perhaps tend to solve. The phenomenon alluded to, may be found to bear on some geological questions, and may therefore merit attentive study.

To confine myself, however, to the subject of this paper, I shall proceed to consider what occurs with the fused masses of litharge on flowing out of the furnace, and to discuss the part which the imprisoned oxygen plays in these masses on their solidifying, which ends in a gradual change of their internal structure.

At Poullaouen, the litharge on running out of the furnace, and when it has acquired a sufficient degree of purity, is collected in iron pots of a conical form, and capable of containing about sixty pints. The litharge soon solidifies on the surface, and assumes a yellow or greenish-yellow colour. In the course of a few hours, sometimes in half an hour, the mass breaks, splitting in every direction, and it becomes a friable, crystalline mass of a decided red colour. The surface alone, which solidifies quickly, retains its colour and coherence. The red litharge, which is carefully selected, is that alone which is saleable; the yellow litharge is put on one side, and reserved for refusion.

Sometimes the phenomenon occurs more suddenly, a sort of explosion takes place, which, in the first place separates the conical mass of litharge into several large blocks; at the same time a certain quantity of litharge is projected from the interior in a liquid or pasty state.

It appears to me that the imprisoned oxygen acts mechanically during the solidification of the litharge, producing the phenomenon of exfoliation.

It is worthy of remark, that all circumstances tending to diminish the rapidity with which the litharge cools and becomes solidified, tend also to augment the proportion of red litharge formed. When it is made to flow into vessels of too small capacity, the litharge cooling too quickly remains yellow, and there is no exfoliation.

M. Fournet considers that the red litharge contains more oxygen than the yellow, and that it owes its colour to the presence of a certain quantity of minium. Many specimens afforded him undoubted evidence of the presence of minium.

M. Thénard and most other Chemists also attribute the colour of commercial litharge to the presence of a small quantity of minium.

Without wishing to deny the possibility of the litharge when slowly cooled, under certain circumstances, absorbing oxygen, and giving rise to the formation of minium, a fact well attested, I believe nevertheless, I shall be able to show that we must seek for another explanation of the phenomenon of exfoliation in the masses of litharge, and the production of the red litharge. The following are the experiments on which I found this assertion :—

1st. The red litharge which I have examined, has not given off oxygen on the application of heat.

2d. This same litharge, examined with much care, by the use of pure nitric acid, did not yield any puce coloured oxide; a trace of minium added to the yellow litharge, without sensibly changing the colour, may be detected by the same mode of examination.

3d. Red litharge, heated to a temperature at which there is no disengagement of oxygen, and quickly thrown into water, becomes yellow.

Experience shows that these variations in the structure and colour of litharge, resulting from the conditions of temperature, accompanying its production, do not depend on any change in its chemical composition, but chiefly on isomeric or dimorphous modifications, similar to those which constitute the difference between vitrious and opaque arsenious acid, barley-sugar and sugar-candy, red and yellow iodide of mercury, &c.

According to the experiments which I have made, these modifications in the structure and colour of the protoxide of lead, have relation to the densities of the different specimens. Exfoliated red litharge is less dense than the crystalline yellow. In my memoir on this subject, some tables will be found relating to the various experiments which were made.

To recapitulate, the facts stated in this paper, appear to me to establish—

1s. That oxygen may be dissolved in fused litharge, as it is in silver, and and that it does not enter into combination as a superoxide; nitrogen may, perhaps, be at the same time dissolved in small proportion.

2d. That there only exist between the yellow and red litharge, physical differences of structure, of colour, and of density, which do not in the least affect their chemical composition. These different varieties may be produced at will, without resorting to fusion, by regulating the temperature and the rate of cooling.—*Journal de Pharmacie.*

OBSERVATIONS ON THE ACTION OF ANIMAL CHARCOAL.

BY ROBERT WARINGTON, ESQ.

About twelve months since a friend requested that I would undertake the performance of an experiment for him, which, if successful, he considered might prove of importance. The idea had occurred to him in passing one of the large breweries, that, from the greatly increased demand for pale ale, such as is exported to India, as a beverage for home use, it would be practicable to discharge the colour from the ordinary beer by artificial means, and thus obtain the desired object. What rendered this, he said, the more important, was the difficulty he had heard expressed by persons interested in the matter, in preparing an article sufficiently pale for the purpose of sale, the malt employed requiring to be made expressly for this quality of beer. To effect this desideratum, he considered that all that would be required would be to pass the fluid through a medium of animal charcoal, and that the ordinary amber colour of ale would be thus partially removed. I undertook to make his experiment for him, at the same time telling him that I thought the beer would be rendered very flat and the flavour much injured, but certainly not anticipating what followed. The method adopted, as presenting the least objectionable points to the successful attainment of the desired object, was to pass the cold ale through a stratum of animal charcoal placed on a paper filter, and to repass the filtrate through the same medium until the required effect was obtained; the ale operated upon was high-coloured, and had a bitter taste and the fine aroma of the hop. The colour was rapidly removed, but the ale was found on tasting extremely vapid and flat, and the whole of the bitter flavour was found to have been also abstracted. Not being prepared for this result, I was surprised at the rapidity of the action, and resolved immediately to carry on the investigation by substituting other and stronger bitters in the place of the hop. For this purpose a quantity of the ale which had previously had the flavour of the hop removed by charcoal was prepared, one portion of which was boiled with bruised gentian root and another with the raspings of quassia wood; but on passing these decoctions when cold through the charcoal filter as before, the whole of the intense bitter flavour which they had imbibed rapidly disappeared.

It now occurred to me that this property of animal charcoal might be made of considerable utility to the Chemist, as, from all our information up to the present time, it does not affect the active alkaline organic principles, and, therefore, should prove the means of separating the bitter of the hop and other materials from that of strychnia or morphia as contained in nux vomica or opium, it being frequently stated that some persons, vendors or makers of this common beverage, are in the habit of adding these and other materials in small quantities to their beer to give it a more intoxicating power. I therefore digested some nux vomica in coarse powder with a part of the ale prepared for the previous experiments, and on passing this when cold a great number of times through the charcoal the bitter flavour still remained, and hence I concluded at the time that my hypothesis was correct. Other engagements broke in on my experiments at this time, and prevented my prosecuting the investigation further.

About ten days since, however, I was recalled to this subject by some other experiments, and tried the effect of animal charcoal on the decoctions of some other astringent bitter substances, as oak bark, Peruvian bark (*Cinchona cordifolia*), and others, all of which had their flavour entirely removed. It may be as well to mention here, that in this second and also in a subsequent series of experiments the animal charcoal was added to the warm solution of the material under trial, and they were digested together on a sand-bath until the full effect had taken place, after which the fluid was passed through a filter. The charcoal used was the ordinary bone-black of the sugar-refiner, purified by digestion with hydrochloric acid, washed as long as any saline matter was abstracted, and then dried and heated to low redness. I then tested the extent of this extraordinary power of charcoal by submitting a decoction of aloes to its action, with the same results, the whole of the bitter flavour being removed.

I had proceeded thus far when I was referred by my friend Mr. Henry to a work published at Breslau in 1842, by MM. A Duflos and A. Hirsch, entitled *Ökonomische Chemie*, where, under the article *Beer*, at page 65, I found nearly all that I had observed described in a few words; namely, that the bitter of the hop, and of all other vegetables used as substitutes for it, as gentian, wormwood, &c., and even aloes, was removed by animal charcoal, but that the bitter of nux vomica, which is often made use of in England, was not affected.

On looking over my experiments, however, my attention was arrested by finding that the decoction of the bark of the *Cinchona cordifolia* had had the whole of its bitter removed. Now, on the grounds stated in the previous part of this paper regarding the active principle, this should not have been the case. I therefore took a small quantity of disulphate of quina, dissolved it by heat in distilled water, and then added the charcoal, and discovered that the whole of the bitter was removed in less than a minute. A solution of acetate of morphia was also submitted to the action of charcoal with a like result. A watery solution of strychnia was similarly affected, and this made it necessary to repeat my former experiment on nux vomica, which had been made on a cold solution and simply filtering it through the charcoal; it was now digested with the aid of heat, and the whole of its bitter flavour quickly disappeared. The statement of Duflos and Hirsch, on this point, is not therefore entirely correct.

To try the extent to which this abstracting power proceeds, two grains of disulphate of quina were dissolved in two ounces of distilled water, and animal charcoal gradually added in small quantities to the warm solution until the whole of its bitter flavour was removed; it was found that twelve grains of the charcoal had been required to effect this.

It becomes a matter of surprise that this power of animal charcoal has, as far as I am aware, never been observed before, notwithstanding the frequent and extensive employment which is made of this agent in the preparation of the vegetable alkalies, their salts, and a great variety of other substances of an organic nature, for which it is directed to be used for the purposes of discoloration in all our chemical works and Pharmacopœias. Numerous analyses of organic substances, in which it has been employed, will also be open to error on the same grounds.

Before leaving this branch of the subject, I should refer to a paper, and I believe the only one that bears particularly on any of the previous statements, by Dr. Louis Hopff, in the 17th volume of the *Journal de Pharmacie*, p. 172, "On the property of Charcoal in destroying the bitter flavour of many bodies;" in which he gives a series of comparative trials with wood and animal charcoal at a temperature between 78° and 86° Fahr. on solutions of a specified strength, of the extracts of bitter herbs, woods, roots, barks, leaves, flowers, and fruits.

I annex a few examples from this paper of substances which have formed the subject of experiment in the present communication, as I believe that the great discrepances which will be noticed arise from the charcoal employed by Dr. Hopff not having been well prepared.

	After twenty-four hours.	After forty-eight hours.	After boiling.
Gentian ...	Had lost a little of its bitter.	Purely bitter.	Had lost very little of its bitter.
Quassia......	Perhaps lost a little of its bitter.	As before.	Lost very little of its bitter.
Aloes	Perhaps a little changed.	A little changed.	As before.
Nux Vomica	Very little changed.	Little changed, still very bitter.	Sensibly less bitter

In a note the author says that the bitter of nux vomica disappeared entirely on agitating its solution with a great excess of animal charcoal.

By analogical reasoning I was led to try the effect of this agent on salts of inorganic constituents, and here a similar action was exerted. A large quantity of sulphate of magnesia was removed from its solution in water, as also of chloride of barium, sulphate of soda, and other salts. The fact of sulphate of lime being removed from its solution has I find been already noticed by Payen and Graham.

On laying the preceding experiments before the Society, I stated that I proposed to carry on the investigation, but I have since met with a paper by M. Chevallier†, "On the action of Animal Charcoal on Metallic Salts," in which he also proposes investigating its action on the *organic salts*. Had I been aware of the existence of this paper at the time, I certainly should not have brought my own experiments forward, and shall not continue the investigation until M. Chevallier has closed his researches. I can only express my regret that I should even thus far have anticipated his results.—*Proceedings of the Chemical Society.*

BOOKS RECEIVED.

ELEMENTS OF MATERIA MEDICA AND THERAPEUTICS. By EDWARD BALLARD, M.D., *Physician to the St. Pancras Royal General Dispensary, and Medical Tutor in University College, London;* and ALFRED BARING GARROD, M.D., *Physician to the Fore Street Dispensary, and Lecturer on Materia Medica and Therapeutics in the Aldersgate School of Medicine.* Large 8vo, pp. 436. *London: Taylor and Walton, Upper Gower Street.*

MEDICAL AND PHYSIOLOGICAL PROBLEMS. By WILLIAM GRIFFIN, M.D. &c. and DANIEL GRIFFIN, M.D. &c. Pp.356. *London: Sherwood, Gilbert, and Piper, Paternoster Row.*

ON THE ANALYSIS OF BLOOD AND URINE IN HEALTH AND DISEASE, *and on the Treatment of Urinary Diseases.* By G. OWEN REES, M.D., F.R.S., F.G.S., &c. Second edition, large 8vo., pp., 218. *London: Longman, Brown, Green, and Longmans, Paternoster Row.*

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† *Comptes Rendus*, vol. xix., p. 1279.

A CASE OF ROBBERY AT WOLVERHAMPTON.

THE *Wolverhampton Chronicle*, of Oct. 22d, contains an account of an extensive robbery which has been committed on Messrs. Mander and Weaver, by one of their porters, John Mason. In consequence of information received on the 28th of August, Mr. Weaver, jun., went to London, and with a sergeant of police called on Mr. Hopkins, Druggist, in Union Street, Bishopsgate, who had, on several occasions, purchased articles of Mason. Among others were two bottles of oil of lavender, which he sold to Mr. Eley, of Kentish Town, for 38*s*. per pound. Mr. Eley afterwards sold them to Messrs. Rowland and Son, of Hatton Garden, where they were found on the 30th of August by the sergeant of police and Mr. Weaver, jun. Two empty bottles were also discovered which had contained essence of lemon, and which were marked with a diamond in Mr. Weaver's establishment. Some invoices were produced in Mason's handwriting. The case was proved against him, and he was sentenced to seven years' transportation. During the evidence it was stated, that Leech (another porter in Messrs. Mander and Weaver's establishment) was in custody for stealing a quantity of mercurial preparations. On examining Mason's books and papers, the names of many Druggists with whom he had transacted business were discovered, some of them of high standing and respectability. It is not to be supposed that the parties in question purchased the goods under any suspicion that they had been dishonestly obtained; but the circumstance should be taken as a warning against the practice of purchasing of strangers any drugs or other articles which are offered at considerably less than the market price. There is reason to believe that persons calling themselves agents not unfrequently wait upon Druggists offering "bargains," which have been obtained in a similar manner to that adopted by Mason. If there were no receivers there would be no thieves; and every man who keeps a Druggist's shop is interested in putting a stop to a practice, by means of which, though he might happen to buy a bargain on one day, he is just as likely to be made a victim the next. The circulation of these "bargains" is also a severe injury to the trade, by creating a ruinous competition in prices generally.

A CASE OF IMPOSITION AT MAIDENHEAD.

Mr. Higgs, the mayor of Maidenhead, has requested us to insert a caution respecting a man who has attempted to impose upon him and others, by offering, on sale or return, a fluid for waterproofing cloths. About three years ago he disposed of a dozen six-ounce bottles, for which a guinea was paid, promising to forward the printed bills and directions for use, and to take back any bottles which might remain unsold. He said he came from the house of Macintosh and Co. He did not return or send the bills as he promised, and the fluid was found to be trash. During the past month he came in another name, that of Burdoe and Co., 96, Cornhill, offering for sale a similar article, and not expecting to be recognized. Mr. Higgs, however, recognized him, sent for a constable, and made him refund the money. The name of Burdoe and Co., 96, Cornhill, is fictitious, although there is a firm Berdoe and Co., No. 69, with which he has no connection. He is a respectably dressed person, about fifty years of age, with a Scottish accent, and writes a bad hand, the fingers of his right hand being apparently stiff.

TO CORRESPONDENTS.

M. P. S. (Isle of Wight).—Oil of turpentine coloured with alkanet root, makes a good red colour for a street lamp, that will not freeze.

O.—(1.) There is probably no such compound artificially prepared as sesquicarbonate of soda, the salt considered as such being a mixture of carbonate and bicarbonate. The bicarbonate in solution gives no precipitate with solution of sulphate of magnesia if heat be not used, and a white precipitate or cloudiness with solution of bichloride of mercury; while the carbonate affords a dense precipitate with the former, and a brick-red precipitate with the latter salt.—(2.) Sulphuric acid may be purified from saline impregnation by distilling it, and from arsenic by diluting it, treating it with sulphuretted hydrogen, or an alkaline sulphuret, and then concentrating it in a glass or platinum vessel.—(3.) The journals are forwarded to the local agents free from expense when opportunities occur.

W. S. W. inquires the cause of a slight explosion taking place on adding creasote to oxide of silver. [It results from the sudden reduction of the silver, and oxidation of the creasote or some of its constituents. A similar effect ensues on adding some essential oils to the oxide.]

"Methyle."—We believe wood naphtha (pyroxilic spirit) is never made independently of other products obtained by the distillation of wood. The process is described in Dr. Ure's *Dictionary of Arts and Manufactures.*

T. G. E. (1.) states that on several occasions while mixing together trisnitrate of bismuth and bicarbonate of potash, he has observed a strong smell of ammonia, and inquires what this can arise from. [We presume the trisnitrate of bismuth must have been impure. In preparing this salt according to the Pharmacopœia, on adding the water to the nitrate of bismuth, two salts are formed—*ternitrate*, which remains in solution, and *trisnitrate*, which is precipitated. It is possible that the manufacturer in recovering the soluble salt may have thrown it down with ammonia, and added the oxide thus procured to the trisnitrate; and if not perfectly washed, the presence of ammonia would be thus accounted for.]—(2.) On adding biborate of soda to alum, if in solution, the alum is decomposed and alumina precipitated. We think the mixture would not be injurious to the teeth.

Peter Lawrence.—(1.) The test alluded to is applied as follows:—Concentrated sulphuric acid is added to a solution of bile until the liquid becomes quite hot, and then a solution of sugar is added, when the mixture assumes a beautiful red or purple colour, the intensity of colour having reference to the proportion of bile present.—(2.) Solution of bichloride of mercury should be kept in bottles excluded from the light.—(3.) When Liquor Plumbi Diacetatis is of a brown colour, it may be presumed to have been made with brown vinegar, and not according to the Pharmacopœia.

Mr. Wickham, A.P.S., has sent us a specimen of crystals from old extract of Hyoscyamus, which consists of chloride of potassium. The specimen being a fine one has been deposited in the Museum of the Society. Mr. W. has also sent us the following formula for Dr. Milliner's Cough Drops:—

℞ Tinct. Camph. Comp., ℥iss.
Tinct. Scillæ, ℥ss.
Acid. Sulph. Dilut., ℥ss.
Syr. Rhœados, ℥vss. M.

H. D. P. (Edinburgh) has favoured us with some observations on the professional character of the Pharmaceutical Chemist, which entirely coincide with the opinions we have frequently had occasion to express in this journal.

M. P. S. (Chipping Norton) describes two specimens of salt sold as sulphate of copper for agricultural purposes, which on analysis he found to consist of—

No. 1.—	Sulphate of Copper	55.5
	Sulphate of Iron	44.5
		100.
No. 2.—	Sulphate of Copper	42.
	Sulphate of Iron	58.
		100.

"Zeta."—We have no precise information as to the manner in which the essence of jasmine and some other essences are prepared. We believe that the oil of jasmine is made by placing alternate layers of the flowers and of wool saturated with sweet oil in a close vessel, for a certain time, and then pressing out the oil. It has been stated that by agitating this oil with spirit, and afterwards separating the spirit, a fragrant essence is obtained.

Mr. Molton, of Liverpool, (1.) recommends the addition of oil of juniper instead of spirit in making the Unguentum Iodinii Compositum, which, he informs us, produces a better and more effectual ointment, and one that does not change colour by keeping. [It is possible that the oil of juniper by stimulating the skin may promote the absorption of the iodine, but the substitution alluded to would be improper unless ordered by the prescriber.]—(2.) *Bandoline.* We have already stated that this consists of a strong mucilage of quince seeds, or Irish moss, perfumed according to taste.

"Associate."—To give plaster casts a bronze colour, saturate them with oil, and paint them yellow. When dry paint them green, and while wet rub off a portion of the green paint from the more prominent parts. Another method is to rub them over with plumbago, and electrotype them with a thin film of copper; then apply the bronzing liquor mentioned vol. iv. page 338.

"A Well-wisher" complains of the scientific articles, and descriptions of foreign plants which have recently appeared in this journal, and which he says are useless and uninteresting. [Our Correspondent will find some formulæ for horse-physic in this number, which we hope will suit him.]

"Inceptor."—When a doubt exists respecting any article ordered in a prescription, it is right to call on the prescriber; if he is not to be found, we cannot give any general directions; the dispenser must act according to the circumstances of each particular case. In the first case alluded to, we think sesquioxide of iron was intended. The second could only be interpreted as written.—(3.) As a general rule the practice is not to be commended.—(4.) We would recommend any Chemist before commencing business to pass the major examination.

A. R. P. S. (Glasgow).—Dr. O. Shaunessy gives the following formula for Tincture of Indian Hemp:—

℞ Ext. Cannabis Indice, gr. xcvj.
Sp. Vini Rect., f℥iv. Solve.

"Turbatus."—See page 221.

"An Associate."—(1.) We believe the "Novargent" is made by moistening chalk with a solution of oxide of silver in a solution of cyanide of potassium.—(2.) The chalk is merely used as a vehicle, and for the purpose of cleansing the surface.—(3.) When a Physician orders a patient to take a certain number of minims of a medicine, the dispenser should explain the meaning of the term minim, and recommend the use of a minim measure

"CURIOUS."—(1.) The *Helianthus tuberosus*, or *Jerusalem artichoke*, is considered to be diuretic, and to give the smell of turpentine to the urine.—(2.) See a paper on Ung. Hydrarg. Nitr., by Mr. Schacht, in vol. iv. p. 450 of this journal.—(3.) The change of colour which takes place in cerat. plumb. acet. arises probably from a decomposition of the acetate of lead caused by the wax or oil.—(4.) Hard extracts may be softened by the application of heat and moisture.

"IGNORAMUS."—(1.) The relative value of coals for heating purposes is generally determined by burning different specimens under similar circumstances in a small furnace arranged for the purpose, and applying the heat generated to the heating or vaporization of water. The arrangement of the apparatus would be modified according to the means of the operator.—(2.) The quantitative determination of sulphur in coals, is effected by treating the coal with nitric acid, and thus converting the sulphur into sulphuric acid, which is precipitated with a salt of baryta. It is necessary to continue the action of the nitric acid, aided by heat, on the coal for a considerable time, and Dr. Ure recommends the process of cohobation.

"BOTANICUS" inquires, whether "the tincture prepared from the *fresh Canabis Indica* is more effective and certain in its operation than that prepared from the *extract* of the same plant." [From the experiments of Mr. Donovan it would appear, that the hemp grown in this country, possesses but little, if any, medicinal activity, and that the dried plant brought from India soon loses its virtues, while the resinous extract carefully prepared from the recent plant in India, and imported into this country, is an active and valuable medical agent.

℥ij.——We cannot speak from experience, but think it probable that a Hessian couble would be sufficiently porous for using as a porous cell in a galvanic process.

K. K.—Next mdnth.

C. J., A. P.S. (Birkenhead) wishes for a formula for making a *black fluid* for writing on zinc plate. It corrodes the part written upon, and is used by florists for labelling flowers, &c.

H. G. P. (Peterborough).—We recommend Fownes's *Manual of Chemistry*.

"ORNITHOLOY."—Hooper's *Medical Dictionary*.

A. P. S. (Evesham).—Blaine's *Veterinary Art*.

J. K. U.—Dr. Roget's *Treatise on Electricity and Galvanism*.

W. C.—*Griffin's System of Crystallography*, 14s.

A. P. S.—*Selecta è Prescriptis*.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to THE EDITOR, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. VI.—DECEMBER 1st, 1845.

THE PRESENT PROSPECTS OF THE MEDICAL BILL.

THE fourth edition of the Medical Bill will shortly come under the consideration of Parliament. We have already pointed out some very weighty objections to this measure in its present form,* and we believe that our sentiments on the subject concide with those of a large portion of the Medical Profession. Whatever may be the fate of the present Bill, it is incumbent upon all parties concerned, directly or indirectly, in the result of this or any similar enactment, to be on the alert at the present time.

The agitation which has prevailed for several years on the subject of Medical Reform, and the party spirit which this kind of excitement is calculated to engender, are highly injurious to the interests, and derogatory to the dignity of the profession. It is, therefore, particularly desirable that the question should be finally and amicably settled during the ensuing session of Parliament. In fact, unless this be effected within the above space of time, we shall despair of seeing the Medical Profession placed under the operation of efficient and salutary laws, as the subject has become so irksome to those who are engaged in it, that another failure would, in all probability, induce all parties to give it up in despair.

It is obvious that, if each class or party in the profession were invited to prepare a Medical Bill, each bill would be so constructed as to favour the particular interests of its promoters. The result would be the same if the said bills were all prepared by the government, with the advice and concurrence of the several parties alluded to. It is equally obvious that of the above bills so constructed, not one would be likely to pass, on account of the opposition which would inevitably be brought against it by those whose interests had not been sufficiently considered in its provisions. No other explanation is required respecting the fate of the four Medical Bills lately introduced.

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*Vol. v., page 98.

Each party has been consulted.* The Colleges of Physicians and Surgeons, the Society of Apothecaries, and the Association of General Practitioners, have severally had the opportunity of criticising and amending the government measure. The result has been the introduction of four editions, or, as they may be termed, distinct bills, three of which in turn have received a *quietus;* and the fourth is likely to share the same fate. But the most remarkable circumstance is this—that the present bill is condemned by all parties, even by those who had the chief share in its concoction.

The first and second bills were supported chiefly by the Colleges of Physicians and Surgeons; and it is probable that the second (namely, that of February, 1845) might have passed, if certain modifications had been introduced into it in favour of the General Practitioners.

The third and fourth bills were modified by the Apothecaries and General Practitioners to suit their particular views. The fourth was, in some respects, controlled by the other powers, but in its construction the Association of General Practitioners took a prominent part, and, at the time of its publication, the Committee stated in their report that, "in the best judgment they can bring to bear on the subject, if the proposed arrangement be carried out *bonâ fide,* the measure is a good one." At a recent meeting of the Committee of the above Association, the following resolution was unanimously passed:—

> "That the present Government Bill has a direct tendency to lower the *status* of the general practitioners in medicine, surgery, and midwifery, and to constitute them an inferior class; and it is the deliberate opinion of this Committee, that in its present shape it ought to be met by the most strenuous opposition of the General Practitioners of the kingdom."

The creation of a new College of General Practitioners has been the favourite scheme of the Association; but the Colleges of Physicians and Surgeons having had sufficient influence to curtail, in several particulars, the powers and prerogatives of the proposed new College, the Committee have discovered that the bill in its present form is objectionable, and must be opposed.

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* The Chemists were omitted because the Bill was not intended to interfere with Pharmacy.

We rejoice in this discovery. At the time of the publication of the bill, we explained what would be the real position of the new College—that it would not be a Medical or Surgical College, but a College of Apothecaries; or, in other words, a Pharmaceutical College.

Such a College as its originators intended it to be would, of course, be opposed by the Colleges of Physicians and Surgeons; and if constituted as proposed in the present Medical Bill, it would not only defeat the objects and disappoint the hopes of its promoters, but would also, as we observed in our number for September, interfere seriously with the province of our body, by permanently cementing the union of the practice of Pharmacy with Medical and Surgical practice.

The proceedings of the past year, although hitherto unproductive of any definite result, have elicited the sentiments of the several parties in the profession, and furnished the *data* on which a comprehensive measure may be founded, embracing what is practicable in the several propositions, and maintaining a just balance of power and privileges among all parties concerned. To attain this object, a general conference and the appointment of a Committee, consisting of the representatives of all the Medical bodies, appears to us to be absolutely necessary, as we feel convinced that until this experiment is tried, but little, if any, progress will be made.

In our number for July (page 7) we suggested the above as the only plan likely to answer; and subsequent events have confirmed our opinion on the subject, as it appears that by the opposite course no progress whatever has been made, and the bill now before the public is less popular than its predecessors.

Since the above was written we have received from a Correspondent in Paris (M. Cap) an account of a "Medical Congress," which has lately been held for the purpose of collecting the opinions of the Medical and Pharmaceutical bodies, respecting the reorganization of the profession. The meetings of the Congress terminated on the 15th of November, and a general report has been drawn up containing the prevailing sentiments and most approved propositions. We are informed that this document is to form the basis of a government measure, for the regulation of the profession. One of the most important questions entertained in this deliberation was, Whether quackery should be suppressed by law or not? and we understand this has been decided in the affirmative. Without entering into the merits of the report, which has not yet reached us, we may observe that the means adopted by the French government for ascertaining the sentiments of the profession were rational and judicious. Our own government has taken a more circuitous and difficult course in obtaining similar *data:* which having been done, the question might advantageously be referred to a small committee, consisting of the representatives of the several parties.

THE PRESENT POSITION AND PROSPECTS OF THE CHEMISTS AND DRUGGISTS.

PRIOR to the establishment of the PHARMACEUTICAL SOCIETY, all the endeavours which were made to introduce any system of legislation, in reference to the practice of Pharmacy, were considered by our body as hostile attacks, and met with violent opposition.

It was not likely that any body of men, however disunited among themselves, would, without a struggle submit to be restricted and placed under the jurisdiction of others by an Act of Parliament respecting which they had not even been consulted. But at that time we were not in a position to be consulted, or to take upon ourselves the management of our department of the profession. Mr. Hawes assured the deputation who waited on him on the subject (Feb. 16th, 1841) that he had no desire to injure or oppress the Chemists. On the contrary, he was anxious to elevate their character by making them an educated body, and he would gladly have consulted them respecting that portion of his Bill which affected their interests, if he had known where to find the representatives of the Trade, or any Committee authorised to negociate in such a matter. No such Committee or Board having been in existence, he had prepared his Bill on the best evidence within his reach, and considered that the position which he had assigned to the Chemists was a "boon" rather than an injury.

But it happened that the conditions on which this boon was to be received, were such as the Chemists did not approve, and were not disposed to submit to. Their only alternative therefore, was to oppose the bill.

The case is now entirely altered. We have united, and established in the form of a voluntary society, a system of education and examination. We have created a representative government among ourselves to carry out the details of the plan;—we are recognised as the representatives of Pharmacy in this country, and a disposition exists in the profession to place this department more completely in our hands than it has hitherto been;—we are the most united body connected with the profession, and our influence has greatly increased in consequence of this union. Nothing is now required but the confirmation of what we have done by Act of Parliament, and during the approaching session our fate will be decided. If we do not succeed in maintaining our proper position and just rights, it will be our own fault.

The leading objects which it is incumbent on us to secure in an Act of Parliament are,

1st. The registration of all persons carrying on business as Chemists and Druggists.

2dly, The introduction of a regular and uniform education for our body throughout the country.

3dly, The examination of all persons who may hereafter enter the business.

4thly, The protection of the public against the proceedings of ignorant persons assuming the title and office of Pharmaceutical Chemists.

5thly, The separation of the trade in Medicines from the practice of Physic and Surgery, as far as this is practicable.

6thly, The recognition of the PHARMACEUTICAL SOCIETY as the governing body in our department, represented by a Council annually elected from among the Members at large: having power to superintend the education, examination, and registration, and to make such regulations as may be requisite from time to time respecting other matters relating to Pharmacy, in which the interests of our body and the welfare of the public are concerned.

THE SEPARATION OF THE TRADE IN MEDICINES FROM THE PRACTICE OF PHYSIC AND SURGERY.

IN advocating the separation of these functions in the profession, it must not be supposed that we contemplate a prohibitory law, imposing a penalty on those who transgress the boundary. This would be as injurious to the public as the opposite extreme; for although it is highly desirable for medical practitioners to discontinue or limit as much as possible the practice of dispensing medicines, there are cases, and in country districts these are numerous, in which they are obliged to furnish every thing their patients may require.

The object of the law, therefore, should be not to restrain the Medical Practitioner from administering to the wants of his patients in such a manner as the circumstances of each case may require, but to institute a regular system of fees for advice and attendance instead of the charge for medicine. Such a law would furnish an inducement to adhere to the desired arrangement, when practicable, without imposing any irksome or improper restrictions.

The mode of remuneration at present adopted by Apothecaries is highly objectionable. It may be taken as a general rule, that whenever the party who supplies an article as a matter of profit to himself, is the dictator respecting the quantity to be taken or used, the purchaser is in danger of being burthened with more than is necessary.

When a lawyer is paid a stated fee for any deed or document, he is not likely to spin it out to a needless length, which would increase his trouble to no purpose. But when the fee depends on the number of words or folios, which is often the case, a simple agreement not unfrequently becomes a most formidable and intricate document, which can scarcely be understood except by the lawyers themselves, the real meaning being entangled and concealed in a multiplicity of words.

If the apothecary were paid a stated fee for his skill and attendance, he would have no inducement to order more medicine than is absolutely needful. But when his only chance of obtaining a moderate remuneration depends on his sending a stated quantity of medicine, whatever may be the circumstances of the case, he ought not to be blamed if he sometimes prescribes more than is necessary. The fault is in the system, rather than in those who act under it; and we believe the number of converts to the custom of charging for advice instead of medicine is daily increasing.

If medical practitioners would discontinue selling medicines, they might with some appearance of fairness, call upon the Chemists to abstain from giving advice; but so long as they encroach on one side, they have no right to complain of encroachment on the other. We have always advocated a mutual accommodation and arrangement, which, we are persuaded, would be beneficial to both parties.

The following observations, extracted from *The Times*, of October 17th, contain a clear and unanswerable statement of facts, to which we call the attention of our readers :—

> "In all large towns, and in many parts of the country, the practice of charging for 'advice, attendance, and medicines' in the lump is rapidly gaining ground. In fact, we may say that among the best practitioners it is likely to become universal, and that in many districts the grade of a professional man may be at once discovered, by ascertaining whether he makes the lumping charge, or spins it out in eighteenpennyworths. It would be better if the word 'medicines' were wholly omitted, and the phrase 'medical

and surgical attendance' were adopted as the proper professional expression; so that the patient might be entirely freed from the notion, that any profit whatever was made by his medical attendant on the medicines prescribed by him. There are, it is true, some patients whose souls are so thoroughly imbued with the spirit of trade, that they would be more uneasy in paying their doctors' bills than in suffering from the want of his attendance, unless they could tick off every one of the items by reference to an empty bottle or pill box; but a very moderate exercise of gentle independence on the part of the practitioner would soon overcome this craving for detail; and, in order that the necessary amount of independence might be created or fostered, nothing would be much more effective than to render the tradesman's style of charging an absolute disqualification for the standing of a surgeon. Apothecaries may properly prescribe and charge for medicines, but then they should be merely and avowedly apothecaries—scientific tradesmen. The man who is both a surgeon and an apothecary, has no right to engross the repute of a professional man and the sordid profits of a trade. If he insists on his professional *status*, he must sink the counter and the till.

"In a national point of view, the charging for medicines is most injurious. The health of all patients who are drenched with medicines by those who systematically make their incomes from them is seriously affected, though not always obviously. Poorly paid as medical men in general are at the best, the temptation to consider rather the pecuniary results than the salutary effect of large quantities of physic is too great for the virtue of many; and the deleterious habit of swallowing vast quantities of drugs, and the consequence of regarding with suspicion the man who pursues the honest course of giving no medicine which is not absolutely essential, are productive of an incalculable amount of misery to invalids. The per centage plan of some physicians and pure surgeons, leads them to follow their brethren of lower grade in 'pouring in' the medicine; and thus their sanction, the motive for which is not less influential however little it may be suspected, tends to keep up the deadly practice. It is to the fact that the homœopathists give a mere semblance of medicine and pay great attention to the regulation of diet and other matters affecting the health, that they owe their great and increasing success. Homœopathy, according to its strict professions, verges at least on quackery, but the very general practice of homœopathists in trusting chiefly to the effect of diet and the due regulation of all ordinary matters affecting the animal economy, rather than to swilling their patients with physic, is consistent with the purest science. They err, of course, at times, in withholding necessary remedies, but on the whole their practice is often far safer than that of the regular drenching practitioner.

"Were the general and per centage practitioners deprived of all inducement to prescribe more medicine than is actually needed, especially were they by the deprivation of all but loss from the quantity prescribed, induced to prescribe as little medicine as the case could do with, the homœopathists would soon find their credit at a discount—for where active medicines are really essential they fail—and not only would the human frame be saved from much needless wear and tear, but—what is as much to our immediate purpose—the profession of medicine would be freed from the taint of trade, and its professors would eventually be even pecuniary gainers."—*Times.*

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

ABSTRACT OF A LECTURE ON THE NATURE AND PHYSICAL HISTORY OF PORCELAIN AND EARTHENWARE,

And on their Applications in Pharmacy, Chemistry, and the Arts.

BY E. W. BRAYLEY, JUN. F.L.S., F.G.S., A. INST.C.E.
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Lecturer on Mineralogy applied to the Arts, &c.

[*Delivered October* 22, 1845.]

IN the introduction to this Lecture, it was proposed to treat the subjects of the nature and physical history of porcelain and earthenware, in a manner similar to that in which those of glass had been illustrated, in previous lectures delivered before the PHARMACEUTICAL SOCIETY* ;—to consider the various kinds of Fictile Ware as consisting of *artificial mineral substances*, and to examine their properties and composition accordingly, in relation especially to their useful applications. Allusion was also made to the fact, that although porcelain does not actually occur in nature, yet there is a series of natural mineral products, intermediate in character between porcelain and ordinary earthenware, and resulting from the action of subterranean heat upon argillaceous substances; of these, specimens of what is termed porcelain-jasper were exhibited as examples.

The principles on which the manufacture of porcelain and earthenware depends, were next summarily explained, the principal of them being stated to be the *plasticity* of certain combinations of the earth's silica and alumina, (silicates of alumina,) constituting *Clays*—or their property of forming with water a soft mass, resembling dough, but which, while it is so soft as to be capable of being moulded with the utmost facility, and of receiving the most minute details of any form impressed upon it, is so devoid of elasticity as to retain that form, with its details, unaltered, and even to preserve them during the drying of the mass, and the final expulsion of the water by heat, up to the high temperature required for its incipient fusion.

The manufacture of fictile wares thus depending on certain properties of silicate of alumina, and the history of silica having been sufficiently considered in the lectures on glass, that of alumina was now entered upon; specimens being exhibited of pure alumina artificially precipitated from solutions of its salts, and as existing in nature in a crystallized state, forming the precious stone called the sapphire, and also the coarser varieties of the same mineral, commonly known by the name of *corundum;* tables and diagrams showing its chemical composition, crystalline forms, and properties so far as capable of numerical expression, being also exhibited and referred-to. The evidence upon which it has been established that the finer varieties of corundum, such as the sapphire and the ruby, are in reality pure crystallized alumina, was briefly discussed. This had first appeared from Klaproth's analysis of the former gem, but the subsequent analyses of the different varieties of corundum, including the sapphire and ruby, by Chenevix, appeared to throw doubt on the subject, by indicating in every instance a certain proportion of silica beyond that attributable to the abrasion of the agate mortar in which the pulverization of the mineral had been effected, or to the impurity of the reagents employed. This doubt was removed by Dr. T. Muir, of Glasgow, who, at the request of Dr. Thomas Thomson, analysed a colourless specimen, which yielded nothing but alumina, and the exact quantity of silica which the mortar had lost. Gustav Rose, of Berlin, afterwards discussed Klaproth's analysis, and repeated the examination of the mineral with great care, arriving at the conclusion that had been previously attained by Dr. Muir and Dr. Thomson, with which however, it would appear that he was unacquainted.

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* See Nos. II. and IV., pages 54 and 153 of the present volume.

According to Berzelius, alumina consists of 53.3 aluminum and 46.7 oxygen; so that if we regard it as a protoxide, it is composed of one equivalent of aluminum 10, and one of oxygen 8,=18; but as it has been found to be isomorphous with oxide of chrome and peroxide of iron, it is also regarded as a sesquioxide, consisting of two equivalents of aluminum 27.4 and three of oxygen 24=51.4. Its specific gravity, in the crystalline state, varies from 3.909 to 4.160, and its crystals yield to cleavage parallel to the faces of an acute rhombohedron of 86° 5′, some of the planes of which occur naturally on certain specimens.

The further consideration of the chemical history of alumina, as the most characteristic element of the materials employed in the manufacture of porcelain and earthenware, being reserved for a second lecture, the nature of *clay*, and its relations to the alumina which enters into its composition, were noticed, all clay being defined to be, essentially, silicate of alumina, but occurring in most, if not in all cases, in nature, combined with water in the form of a hydrate. As a part of this branch of the subject the origin of clay was considered, and it was shown, after M. Ebelmen, that clay, in all cases of its direct production, results from the disintegration and decomposition of igneous rocks, effected by the action of water and of the carbonic acid, and sometimes the oxygen of the atmosphere, on the various silicates, or combinations of silica with bases, entering into the constitution of those rocks. In illustration of this, Ebelmen's recent analyses of the basalt of Crouzet, in Auvergne, (one of the products of the extinct volcanoes of central France,) both in its unaltered and decomposing state, were cited and explained. It appeared from these analyses that in the process of decomposition of this rock, two-thirds of the silica which it originally contains, are removed, together with nine-tenths of the oxide of iron (protoxide in the unaltered, peroxide in the decomposed rock) one-half the lime, ninety-six hundreths of the magnesia, and five-sixths of the potash and soda. In all, forty-three per cent. of the elements of the basalt disappear during decomposition; the alumina alone remaining undiminished, and a quantity of water having become united with that and the residual elements of the decomposed rock. The probability was also shown that the final result of this process of decomposition would be the separation of the remaining bases, together with a further portion of the silica, leaving the alumina combined with the remainder of the silica and with water in the form of a hydrate, constituting, in fact, a variety of clay. A similar process of decomposition, finally resulting in the production of some kind of clay, appears to take place with the silicates of all the igneous rocks, whether related to granite or to trap, whether formed by the agency of heat at great depths within the crust of the earth, or poured forth by submarine or subaërial volcanoes, geologically ancient or modern, upon its surface. Of this process and result, the decomposition of the felspar of granite and other rocks of the same class, and its consequent conversion into *Kaolin* or Porcelain Clay, is a particular case.

Sir Humphry Davy, it was remarked, had in his *Lectures on Agricultural Chemistry*, substantially laid the foundation, as Professor Liebig had with full justice admitted, of the modern science of the Chemistry of Agriculture and of Vegetable Physiology; and on the present occasion the merit was claimed for Davy, of also having, in his various works, substantially laid the foundation of the modern science of Chemical Geology. In the instance immediately under consideration he had anticipated Ebelmen and also the French geological chemist, Fournet, in asserting the true agents in the decomposition of felspars and its conversion into porcelain clay to be water and carbonic acid.*

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* See *Philosophical Transactions*, 1808, p. 34.

As this substance is the basis of the most important of the fictile wares, and as it may correctly be regarded as forming a type of the clays in general, its natural history was further pursued, nearly as follows.

It had been at first thought by chemists, by Davy, for example, that kaolin differed from felspar merely in consequence of the abstraction of alkali from the elements of the latter, which are in all cases silica, alumina, and a fixed alkali, or an alkaline earth. The French mineralogical chemist Berthier, first proved that a considerable portion of the silica in felspar was removed at the same time with the alkali, in the process of its conversion into kaolin, maintaining that the felspar became separated into a silicate of potash, which was removed by the agency of water, and a silicate of alumina which remained. It has since been maintained also by Dr. Forchhammer, Professor of Geology and Chemistry at Copenhagen, and by MM. Brongniart and Malaguti (both attached to the Royal Porcelain Manufactory at Sèvres), in France, that the removal of the silica in the process by which kaolin is produced, results from the presence of alkali, and the solubility of the alkaline silicate which is separated. The late researches of Ebelmen, however, to whom we are indebted for the first comprehensive investigation of the entire subject of the chemical changes by which the igneous rocks are converted into the materials of many of the sedimentary strata, have shown, that minerals composed of silicates devoid of any alkaline base, are decomposed in nature as readily as felspars, sometimes even more rapidly, and that the removal of the silica in certain cases is much more complete than in that of porcelain clay. The separation of silica from the silicates is, therefore, independent of the presence of alkali.

Adopting and extending the suggestion of M. Fournet (originally made however by Sir H. Davy, as already intimated), that carbonic acid is in reality the agent in the formation of kaolin, Ebelmen has shown that in all the cases examined by him, the decomposition of the silicates of the igneous rocks has been effected by means of oxygen and carbonic acid, the latter decomposing the silicates, and the former converting their protoxide of iron into peroxide. Silica is very soluble in water containing alkaline carbonates; it is sensibly soluble in pure water, and in water charged with carbonic acid. Lime and magnesia are also soluble in carbonated water. Under the prolonged influence then of a liquid charged with carbonic acid, such as are all the waters which filter through the interior of the earth down to great depths, minerals consisting of silicates will be decomposed and dissolved. Accordingly, we find in mineral waters silica itself, and also carbonates, including carbonate of iron, but we never find silicates in them. But alumina scarcely enters into combination with carbonic acid, nor is it dissolved by carbonated water; while, on the other hand, it has a very strong attraction for silica. Hence, in the decomposition of silicates, it remains, as the final result of the process, united with a certain proportion of silica and with water, in the form of clay, as already exemplified in the final result of the decomposition of the basalt of Crouzet.

The natural process by which clay is produced having thus been reviewed, the particular case of the conversion of felspar into kaolin, and the composition and properties of that substance were considered, various specimens of both minerals being exhibited in illustration. If from 100 parts of the potash-felspar of Halle, analysed by Brongniart and Malaguti, consisting essentially of 62.76 of silica, 19.20 of alumina, and 14.90 of potash, we suppose to be subtracted trisilicate of potash, consisting of 43.95 silica, and 14.90 potash, there would remain 18.81 of silica and 19.20 of alumina, which is almost exactly the composition of the kaolin resulting from the decomposition of that felspar, as determined by the analysis of the same chemists.

Tables were exhibited, stating the composition of many other varieties of kaolin, as ascertained by the analyses of different chemists, both English and foreign. The original kaolin of China, from which all other varieties have derived that appellation, contains, according to Malaguti, after the water has been expelled, 76 per cent. of silica, and 17 of alumina, with 6 of potash and soda; the silica being thus the most abundant element, while the alumina is the most characteristic, which is in fact the case with every kind of clay. The kaolin of Japan is very similar in composition, but retains less alkali. That of Seilitz, near Meissen, in Saxony, contains, according to the analysis of Kühn, the water having been expelled, silica 54, alumina 44, with a trace of potash; that of Morl, near Berlin, analyzed by Mitscherlich, silica 71.4, alumina 26, with traces of lime and potash; that of St. Yrieux, in France, according to Berthier, silica 46.8, alumina 37.3, water 13, and potash 2.5. The porcelain clay of Dartmoor, in Devonshire, analysed by Dr. Fownes, is almost identical in composition with the French specimen last mentioned, while Dr. Boase found in that of St. Stephen's, in Cornwall, silica 39.55, alumina 38.05, water 12.50, magnesia 1.45, with an insoluble residue amounting to 8.70 per cent: this was in all probability chiefly silica, and if we add 8.70 to the amount of that earth actually obtained, we shall have as the result proportions of all the ingredients closely corresponding with those stated by Berthier and Fownes in the preceding analyses.

Pure kaolin, in the natural state, would appear to be a compound of single equivalents of silica and alumina, with one or two equivalents of water; and it is remarkable that there is a tendency in the process of decomposition of all silicates containing alumina, to the production, as the final result, of this particular combination.

A view was also taken of the composition of different varieties of pipe-clay and other ordinary clays. The celebrated clay of Stourbridge, in the Staffordshire coal-field, so important in furnace operations, and for the manufacture of glass-house pots, consists, according to Berthier, of silica 63.7, alumina 20.7, water 10.3, and oxide of iron 4. The Devonshire clay, analysed by the same chemist, contains silica 49.6, alumina 37.4, water 11.2. The fine red clay, of which the North-American Indians make their pipes, the locality of which the celebrated American traveller, Mr. Catlin, was the first white man to visit, and which has been named Catlinite from that circumstance, yielded in Dr. Jackson's analysis, silica 48.2, alumina 28.2, magnesia 6 or 7, water 8.4, peroxide of iron 5, with carbonate of lime 2.6, and oxide of manganese 0.6.

The natural history of the principal materials of porcelain and earthenware having now been reviewed, the attention of the Society was directed,—to specimens of the chemical porcelain manufactured at Berlin, and at Meissen in Saxony (the latter termed Dresden ware) which had been kindly contributed for the illustration of the lecture, by Mr. Charles Button, of Holborn, by whom they are largely imported for sale in this country;—and to specimens of stone-ware pottery and porcelain mosaics, exhibited by Messrs. Alfred Singer and Co., of Vauxhall, the manufacturers. The properties and the process of manufacture of the Berlin and Meissen porcelain were also noticed, together with the process recently proposed and patented for the production of an equally perfect description of porcelain in England; but the more complete consideration of this branch of the subject was reserved for the second lecture. Among the characters of the Berlin unglazed or biscuit porcelain, Mr. Brayley mentioned that upon minutely examining it under the microscope, with high powers, it had appeared to him to be perfectly homogeneous, not merely in constitution, but in texture, not the slightest trace of structure being observable in it, but its appearance exactly resembling that which is presented to the naked eye by the jelly called *blanc-manger*, and by some of the finer varieties of calcedony.*

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* Ehrenberg's microscopical observations on the structure of porcelain will be noticed in the second lecture.

CONVERSAZIONE,

AT THE HOUSE OF THE PHARMACEUTICAL SOCIETY,

November 12, 1845.

INSTEAD of the usual Pharmaceutical Meeting, a Conversazione was held on this occasion, to celebrate the completion of the new Laboratory, which was open for the inspection of the Visitors, Members, and Associates of the Society.

The new Laboratory, which is on the basement, contains accommodation for eighteen pupils, with all the apparatus required for conducting the various processes, the testing of drugs, and analytical or synthetical researches, connected with the science of Pharmacy and its applications.

Several of the above processes were in progress; for instance, the manufacture of sulphuric ether by the continuous process, of pure hyponitrous ether by Professor Liebig's process, of alcohol, carbonate of ammonia, bicarbonates of potash and soda, butter of antimony, nitrate of silver, &c.

The furnaces, sand-baths, stills, drying closets, presses, and other implements, were in operation, in order to give a correct idea of the capabilities of the Laboratory for the education of students in Pharmaceutical Chemistry.

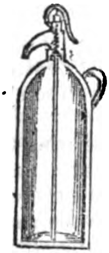
The old Laboratory, which was the only one in use during the last session, was also open for inspection. It contains accommodation for ten pupils, and is furnished with a plentiful supply of apparatus, more particularly for delicate operations on the small scale, not requiring the aid of furnaces. The two laboratories are therefore together fitted for the reception of about thirty students, and the accommodation can be further increased in the event of a demand existing. Sixteen pupils have already entered this season, and several more have signified their intention of entering shortly.

The Curator's room, which is also Mr. Redwood's private laboratory, is a lofty and commodious apartment, provided with an efficient set of furnaces, and every requisite convenience. In this room was exhibited a set of models of crystals, of large dimensions, in wire, ingeniously contrived and made by Mr. Larkin, who was present to explain their object. Here also Messrs. Mayo and Co., Soda Water manufacturers, of 17, Silver Street, Wood Street, exhibited their *Patent Syphon Vase* and *Ice-pail*, for *Ærated Waters*, a considerable number of which being charged with soda water, an opportunity was afforded to many of the company present of testifying to the excellence of the beverage, as well as the superiority of this method of supplying ærated waters when drank at a party or a dinner-table, over the more common but very inconvenient one of opening a separate bottle for each required draught. The following wood-cuts and description will explain the construction of this apparatus :—

Syphon Vase in a Stand of the same material.

Syphon Vase in Ice-Pail of same material

Syphon Vase in Porous Cooler.



Section of Syphon Vase.

The patent syphon vase has for its object the means of affording to consumers of ærated waters, at the refreshment table, or in the sick chamber, such quantities as they may from time to time desire, without the waste and inconvenience which arise from the use of those beverages in the ordinary bottle.

The vase is formed of the finest description of Staffordshire stone-ware, and is capable of containing about as much as four common soda-water bottles. Each vase is surmounted with a mechanical contrivance, serving to encase an inverted valve, which is opened when desired by the application of the thumb to a small external lever. Every vase prior to its being so surmounted, is submitted to an hydraulic proof of twenty atmospheres to test its strength and soundness; and in afterwards filling it with the carbonated water for consumption, a pressure of ten atmospheres only is employed. This precaution is taken to ensure safety. A glass tube in connection with the valve descends to within the eighth of an inch of the bottom of the vase, and by the force of the pressure within, the whole contents may, at the pleasure of the consumer, be discharged while the vase rests on its base. The purity of the materials employed affords the certainty of the waters remaining for any length of time without acquiring the slightest taint; and by experiments that have been tried, vases of the carbonated water have been emptied by degrees, at distant intervals, over a period of twelve months, the last wine-glassful being as pure and pungent as the first. The invention was first brought before the public in Paris, where it is extensively used, and the ærated water, which is there so largely consumed under the title of *Eau de Seltze* (to the almost total exclusion of the genuine water from the Nassau springs) is in its composition exactly the same as the waters with which the patentees in London fill their vases.

In the Library and Lecture-room there were a large variety of rare and valuable specimens—chemical, pharmaceutical, and botanical; together with new philosophical instruments and chemical apparatus. Among these we may enumerate a beautiful collection of Madrepores, from Mr. Pettigrew; a very fine specimen of the fruit of the sago palm (*Sagus Rumphii*), a large bunch of cocoa-nuts (*Cocos nucifera*), the fruit of the palm-oil tree (*Elais guineensis*), a large section of the cork-tree, a stem of the rice-paper plant, specimen of the sack tree (*Lepurandra saccidora*), &c., from Mr. Ward, of Wellclose Square; a stem of the *Corypha cerifera*, the tree yielding the Brazilian wax, from the Museum of the Society; specimens of grass-tree gum from Sydney, presented to the Society by Mr. J. S. Bowerbank, a fine specimen of Chinese galls, of false Angustura bark, and of valerianate of quina in fine crystals, from the Vice-President of the Society; a series of preparations illustrating the manufacture of rice starch, from Mr. Jones, of Hackney; specimens of the *patent membrane capsules*, from Messrs. Evans and Lescher, the patentees.

Patent Capsules or Envelopes for facilitating the conveyance into the stomach of nauseous Medicines.—This kind of capsule was invented by an eminent Chemist of Paris. The substance of which the envelope is formed is animal membrane, of exceedingly delicate texture.

The advantages which the patent capsules possess over the common gelatinous capsules are various. They are soft and pliant in the mouth, are tasteless, and can be swallowed with perfect ease. When they reach the stomach they produce no distressing eructations, whatever be the medicine they contain. Their utility is particularly manifest in reference to balsam of copaiva and other medicines, whose efficacy is augmented by their reaching the intestinal canal without undergoing the dilution attendant on their admixture with the contents of the stomach: this has been proved by repeated experiments. With medicines of this description a *double* membrane is used, and active digestion is thereby in a measure checked, so as to admit of the capsule finding its way into the duodenum before its contents are set free. Other medicines may be covered by a *single* membrane only, when their action on the stomach is desired.

The other objects of interest in the rooms consisted of portraits and autographs of celebrated Chemists, including the portrait of the late President of the Society, William Allen, F.R.S.; Daguerreotypes from M. Claudet and Mr. Willat, several microscopes, &c., &c.

The Conversazione was very numerously attended. A great number of the leading Physicians and Surgeons, Professors and Lecturers, and other scientific men, favoured the Society with their company, and expressed satisfaction at the progress the Institution had made, and the facilities it appeared to possess for advancing the education of Students in Pharmacy and Chemistry. Tea and coffee were supplied in the Council-room;* and we regret that this part of the proceedings was not so efficiently managed as could have been desired, which circumstance arose from the fact that the attendance was more than twice as numerous as the Council had anticipated. This also led to some confusion in the distribution of the hats and coats, which on a future occasion may be easily guarded against by a more methodical arrangement. On the first occasion of a Conversazione being given by a society, it is extremely difficult to calculate with accuracy upon the probable number of guests, and in this instance ample provision was made for the reception of between three and four hundred, while those who came (including the Members and Associates) amounted to more than twice the number; and at one period of the evening the influx was so numerous that it was impossible to enter the names in the book, and the attendants were overwhelmed with the inundation of hats and coats, which they were unable to arrange fast enough. With the exception of this source of annoyance (which experience will enable us to avoid in future), the Conversazione was in every respect satisfactory, and very much exceeded the most sanguine expectations of the Council.

The detailed description of the Laboratory is unavoidably deferred until next month, as the plates could not be executed in time for this number.

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* It ought to be stated that the refreshment was furnished by the Council, the funds of the Society not being applicable to such a purpose.

ORIGINAL AND EXTRACTED ARTICLES.

CASE OF POISONING BY SMALL AND REPEATED DOSES OF ACETATE OF LEAD.

BY H. LETHEBY, M.B.,
Lecturer on Chemistry at the London Hospital.

Matthew Muir, aged six years, was attacked about nine weeks ago with hooping cough. His mother, in her gossip with the neighbours, heard about the wonderful efficacy of a medicine sold by a schoolmaster, who lived in the Kingsland Road. She consequently sent there, and procured a bottle of it, the instructions being that the child should have a teaspoonful whenever the cough was troublesome, but she only gave it two or three times a day.

Upon examination, the mixture was found to consist of ten grains of acetate of lead dissolved in six ounces of water, so that the child had been taking ⅕th of a grain of sugar of lead two or three times a day, for nearly nine weeks. About this time it got worse, and Dr. G. A. Rees was sent for. This gentleman instantly recognised the symptoms of poisoning by lead, and after searching into its source, he traced it to the medicine, and advised its discontinuance. Two days after this the child died, and at the instance of the coroner, we were called upon to make a further inquiry into the case.

It was learned from the parents, that the child was a fine, healthy boy before this sickness, but that almost immediately after it had commenced taking the schoolmaster's medicine, it began to fall away, and to complain of severe pains in its belly: these were proved to be of a colicy nature, by the fact that the child always lay upon its abdomen when it sought relief or went to sleep; its belly also became hard and rather pinched in; the bowels were very confined, and the stools black and disagreeable, there was also a most intolerable fœtor of the breath; latterly the child got very drowsy, and was unable to move about as usual, in short, the limbs were beginning to get palsied Upon the day of its death, however, it became convulsed, and a few hours before death, fell into a state of coma, from which it was never roused.

Six days after death, the body was examined in the presence of Dr. Rees and Dr. Monk. It was extremely emaciated, the skin presenting a dingy yellow appearance, the lips and inside of the mouth were bloodless, and of a pale lavender hue, while the gums had acquired a deadly blue colour, the colour deepening as it reached the margins which bounded the teeth.

The brain was rather softer than natural, but this might have been due to decomposition, rather than to any action of the poison; the cortical substance, however, had a peculiar blueish gray colour, and there were about two drachms of clear fluid in the right ventricle.

The spinal cord was perfectly healthy and firm.

The lungs were slightly congested, especially upon the posterior aspect. The *trachea* and *bronchi* were lined by a sanguineous secretion, a product in all probability of the hooping cough. The *pleuræ* contained a large quantity of bloody serum.

The heart was somewhat larger than natural, flabby, and it contained a little black uncoagulated blood, the same kind of blood was likewise observed in all the large veins.

The abdomen presented the usual evidences of poisoning by lead. The stomach and intestines were pale and nearly empty, the former being uncontracted, and it contained about half an ounce of a thick, brownish fluid; the latter were contracted in some places, and dilated in others, and they presented several points of intus-susception. The large intestines were also dilated and contracted alternately along the whole of their course. I must not omit to mention that the bronchial and mesenteric glands were enlarged, but that the mucous glands of the intestines were healthy throughout their course. The bladder and ureters were full of urine, and appeared as if their muscular coats had been paralyzed. The rest of the viscera were healthy.

Chemical Examination.—Upon subjecting the several tissues and fluids to analysis, they were found to contain an abundance of lead—thus it was detected in the brain, the muscles, the liver, the intestines, the blood, and in the fluid of the ventricle; but it could not be discovered in the bile or urine. One point of a curious nature was observed in reference to the action of the bile on the liver: namely, that that part of the liver which surrounded the gall bladder had acquired a deep blueish black colour, and this arose from the action of the sulphur of the transuded bile upon the lead contained in the tissue of the liver —while the bile itself which remained in the gall-bladder was of its natural yellow colour.

Remarks.—In this case .2 of a grain of acetate of lead had been given to a child, six years old, once, twice, and sometimes three times a day, for the space of nine weeks, and during that time, as it appeared from the mother's evidence, it had taken about sixteen, or from that to twenty, ounces of the mixture, a quantity which would contain from 26.6 to 33.3 grains of acetate of lead. This produced death, and gave rise to all the symptoms of poisoning by lead; such as the blue gums, the great emaciation, the aching pains, the costive bowels, the fœtor of the breath, the palsy, convulsions, and, towards the last, coma; while the *post* *mortem* appearances exhibited a paralyzed condition of the involuntary muscles; there was a distended bladder and an alternately dilated and contracted state of the intestines, especially of the colon, and the blood was black and uncoagulated. Mitscherlich in his cases found the blood red and firmly coagulated. With respect to the chemical inquiry, one or two points are worthy of notice, namely, that while the tissues were saturated with lead none could be detected in some of the secretions, as the urine and the bile; this will appear the more singular when we reflect that they are the two great channels by which effete and poisonous matters are eleminated from the system. Again, the presence of lead was recognised in the contents of the stomach, although none of the medicine had been given for two days.

The coroner, in commenting upon this case, very properly censured the careless manner in which such a poisonous medicine had been dispensed; and observed that if another case of this kind were to fall under his notice he should consider it to be his duty to advise the jury in bringing in a verdict of "manslaughter."

10, *Tredegar Square, Bow Road,*
November 15, 1845.

VENTILATION OF COAL MINES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—PERMIT me to lay before your numerous and scientific readers, the following simple plan for the complete and perfect ventilation of coal mines; and to occupy as little of your valuable space as possible, I will now proceed to describe my plan by first observing, that all the explosive gases are much lighter than the atmosphere, and consequently they ascend to, and are to be found in the roof and upper part of the mines: here they collect, and there not being any means adopted to carry off these explosive gasses, if through the want of caution on the part of the miner his light should be brought in contact with these gases, they immediately explode, dealing death and destruction to all around. All coal mines are worked by steam power, and to generate the steam it is necessary that there should be large furnace fires going night and day, and there are one, two, or three fires, according to the extent of the mines.

First, The ash-pits to these furnaces should be inclosed by doors made air tight. At the bottom of the ash-pit and beneath the furnace let a barrel drain be dug, running from under the furnace to the mouth of the shaft, this drain being made underground and well rammed with clay will make it air-tight down to the shaft; connect to this barrel drain an iron pipe of the same size, let the iron main descend to the bottom of the shaft, then branch off to the several workings; suppose the iron main to be eighteen inches diameter, then of these several branchings, going in different directions, let each of these pipes be seven inches diameter. These pipes may be carried in the tramway to the furthest extent of the mine. Let these pipes have an elbow, and the pipe inserted be carried up above the roof of the mine, cutting a dome to allow all the foul air and expansive gases to accumulate. As soon as these connecting pipes are complete, and the passage of them rendered air-tight to the furnaces, the fires to support their own combustion will immediately draw off all the air, foul or not, which will be consumed by the fires; if there are any of the explosive gases they will assist to generate the steam. And as fast as these air-tight tubes or pipes exhaust the air in their immediate locality, so will fresh air rush down the shaft, and instantly take the place of the foul air that has been exhausted by the furnaces. This plan will effectually prevent any future explosion, by so working the roof of the mine that all the gases as they collect shall pass off to the dome, under which is the pipe constantly exhausting the air; but in cases where the furnaces are not continually burning, I propose placing in some convenient spot a large close furnace, constructed that it shall consume the refuse coal lying at the mouth of the shaft, in a state of spontaneous ignition, and consequently of no use. A branch barrel drain being carried from the furnace into and connected with the barrel drain from the other furnaces, so that this furnace will be performing the same office, namely, ventilating the mine, by burning the refuse coal, and keeping them in a constant state of ventilation.

I am, Sir, your most obedient servant,

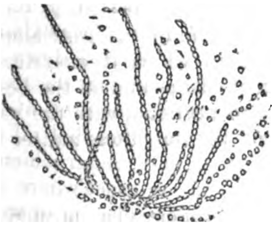
Mineral Water Works, JOHN WEBB.
Islington Green, London, Nov. 17th, 1845.

THE POTATO DISEASE.

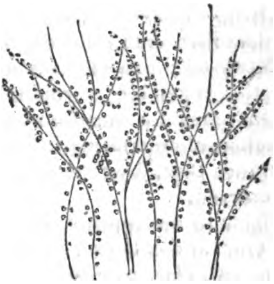
THE disease which has produced such extensive ravages among the potato crops, throughout a great part of Europe and North America, continues to occupy much of the public attention, to occasion serious anxiety and alarm, with regard to its probable effects during the approaching winter, and to form a subject for the investigations of the Naturalist and the analytical Chemist. Much diversity of opinion has been expressed by those who have written on the subject, both as to the probable origin or cause of the disease, and the best means of counteracting or providing against its effects.

By some the disease is ascribed to the influence of a parasitic plant or fungus, the *Botrytis infestans*, which is said to be always found growing on the diseased plants. The spores of a species of fungus, called *Uredo tuberosum*, have also been found in the cells of diseased potatoes.

Most observers have agreed in considering that the disease commences in the stem of the plant, and is propagated from thence to the tubers. The manner in which this propagation has been supposed to take place, is represented by the following wood-cuts, which are copied from a French publication :—



The granules indicating on the stem the longitudinal fissures.



The longitudinal fissures conveying the disease to the tubers.

On the other hand, there are those who deny that fungi are necessarily present where the disease exists. Among the advocates of this opinion is Mr. George Phillips, an excise Chemist, who has published a small pamphlet on the potato disease, containing the results of a microscopical and chemical examination of the healthy and affected plants. This author also denies that the disease commences in the stem of the plant; and says he has always found it first manifested in the tubers, and in those of the tubers which are deepest in the ground.

Professor Liebig says, "The researches I have undertaken upon the sound and diseased potatoes of the present year have disclosed to me the remarkable fact, that they contain in the sap a considerable quantity of vegetable casein (cheese), precipitable by acids. This constituent I did not observe in my previous researches. It would thus appear that, from the influence of the weather, or, generally speaking, from atmospheric causes, a part of the vegetable albumen which prevails in the potato, has become converted into vegetable casein. The great instability of this last substance is well known, hence the facility with which the potato containing it undergoes putrefaction. Any injury to health from the use of these potatoes is out of the question, and nowhere in Germany has such an effect been observed. In the diseased potato no solanin can be discovered."

A variety of methods have been suggested for preserving the sound tubers; for arresting the further progress of the disease in those that are but slightly affected; and for recovering at least some part that may be useful as food, from those that are most diseased.

We have already published, in the October number of this journal, some suggestions on these points, emanating from a body of practical men, which have called forth the following communication from a correspondent:—

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—I have noticed in the remarks contained in your journal of October, and in every communication I have elsewhere seen relative to the potato disease, that the *whole* of the nutriment of this vegetable is referred to the starch which it contains; great pains are therefore taken to instruct the public in the best method of separating it from the diseased portions, with the assurance that, by so doing, the whole of the nutritious matter is preserved.

This to me appears erroneous.

Our aliments are, from their chemical differences, arranged into two classes, azotized and nonazotized. In the latter are included the starches, sugars, and all bodies not containing nitrogen; and in the former, the various modifications of proteine, and those in which nitrogen forms an essential element. Each of these classes has its distinct duties to perform in the various functions of vitality: the nonazotized aliments are employed in those of respiration and the support of animal heat, and the azotized in the reproduction of those portions of our frames which are consumed by the incessant wear and tear to which they are subject by the processes of secretion and excretion. In the healthy potato both these conditions exist, the starch already admitted representing the nonazotized class, and an albuminous matter, exactly corresponding in chemical composition with the fibrine of the blood and tissues, belonging to the class of azotized bodies. It is this circumstance that renders this vegetable so eminently useful as an article of food, and enables many to depend almost entirely upon it for support; but if, as is the case, this albuminous portion be destroyed, or so altered as to become injurious, it is incorrect to ascribe to the residual *starch*, the double functions of the two classes. No doubt the separation of the healthy from the diseased part is greatly to be recommended, as under any circumstances it is better to lose a part than all, but the mere difference by weight thus experienced does not correctly state the loss as will certainly be proved to their sad disappointment by those who, depending on this as the main article of food, do also rely on this unfortunate assurance.

I am, Sir, your very obedient Servant,
GEORGE FREDERICK SCHACHT.

3, *Regent Place, Clifton.*
October 26, 1845.

Full and explicit instructions for preserving the sound or but slightly diseased potatoes, will be found in the subjoined address from the commissioners appointed by the government to investigate the state of the potato crops in Ireland.

ADVICE CONCERNING THE POTATO CROP.

TO THE FARMERS AND TO THE PEASANTRY OF IRELAND.

"THE dreadful disease that has attacked your potatoes, is one, the effects of which you can only stop by strict attention to the advice of those interested in your welfare. Many plans have been proposed, and after examining them all, we recommend the following as the best:—

"All competent persons are of opinion that the first things to bear in mind are the following directions:—

"1. Dig your potatoes in dry weather if you can, and if you cannot, get them dry somehow as fast as you can.

"2. Keep them dry and cool.

"3. Keep the bad potatoes separate from the good.

"4. Do not pit your potatoes, as you have been accustomed to do in former years.

"5. Recollect that if they get damp, nothing can make them keep; and do not consider them dry unless the mould which sticks to them is like dust.

"6. Do not take them into your houses, unless you want them for immediate use.

"*Digging and Drying.*—As you dig the potatoes, leave them in the sun all day; and if you can, throw them upon straw, turning them over two or three times. At night you may gather them together and cover them with straw, so as to keep off frost. Next day take off the straw, spread them out, and give them the sun again. Do this for three days running, if the weather permit. If you put straw enough upon them at night, they will not suffer.

"If the weather be unfavourable, and you have a dry loft or outhouse large enough to hold them, you may spread them thinly on the floor, allowing a free circulation of air, so as to dry them there.

"They must be got dry.

"*Sorting the Potatoes.*—As soon as they are dry you must sort them. Pick them one by one, and put in one heap the very bad ones, in another those which are not so bad, and in a third those that are sound. Treat the bad potatoes as shall afterwards be directed, and store the sound ones according to the directions given in the next paragraph. You will know the very bad potatoes by their unpleasant smell, and the second set by their skin looking brown or dull, and not bright as it generally does; a very little practice will teach you how to distinguish them easily from each other.

"*Storing.*—When the potatoes are quite dry, and well sorted, proceed to store them thus:—Mark out on the ground a space six feet wide, and as long as you please. Dig a shallow trench two feet wide all round, and throw the mould upon the space, then level it and cover it over with a floor of turf-sods, set on their edges. On this, sift or spread, very thinly, the dry mixtures, or any of the dry materials described below, and which you may call packing stuff. Also, get some dry slacked lime, and dust all the potatoes with it as well as you can. Then put one row of turf-sods laid flat, on the top of the floor, all round the sides, so as to form a broad edge, and within this spread the dry potatoes, mixed well with packing-stuff, so as not to touch one another. When you have covered the floor in this manner up to the top of the sods, lay another row of sods all round the first, so that half of each sod may rest on the bed of potatoes, and the other half on the first layer of sods; this will make another edge one sod deep, which must be filled up with dry potatoes, and dry packing stuff, as before. Then lay another edge of sods in the same way, fill it again, and go on till the heap is made. When the building of this pit is finished, it may be covered with sods at the top, and will be ready for thatching. If rightly made, it will look like the roof of a cottage cut into steps.

"If you do not understand this, ask your landlord or your clergyman to explain its meaning, and we are sure that they will give you every assistance; also recollect that the recommendation applies only to sound potatoes, after being well dried.

"You will lose nothing by applying these materials in storing, for the turf can be burnt as you use up the potatoes, and the mixture of lime with dry clay or ashes, which you are afterwards directed to employ, will form a good manure after having saved the potatoes. The only difference is, that you must get what you want now, instead of waiting till another time.

"After you have completed the heap, thatch it so as to throw off the waters into the ditch and keep out the frost.

"In districts where there may not be spare turf sufficient to form the pits in the above way, make them as follows:—Mark out the spot, and make the trench as before. Lay on the ground a floor of stones, about as large as apples, and over them as much heath, brushwood, or twigs, as will just cover the stones. On this floor form the heaps of potatoes and packing stuff, just as described, for the turf-pit. Cover the sides of the potatoes with more of the packing stuff, and thatch in the usual way.

"We must again impress upon you that to pit potatoes in your usual way is certain destruction to them.

"*Packing stuff.*—This, which is of the greatest consequence, may be prepared in either of the following ways—some of you may prefer the one, some the other:—

"*First way.*—Mix a barrel of freshly burnt unslacked lime, with two barrels of sand or earth, as dry as you possibly can get it. The lumps of lime should be broken into pieces as large as marbles, and the mixture should be left twenty-four hours; at the end of that time turn the heap well over, mixing the lime and sand (or other dry materials) till no lumps of lime can be found.

"*Second way.*—Mix well equal quantities of earth and turf, or dry sawdust; put a few sods of lighted turf on the ground, place the mixture on them by degrees till a large heap is made; in a few hours the fire will have spread through the heap, which is then to be covered with earth so as to put out the fire. In fact, this is to be managed just as if you were burning land. This burnt mixture forms a very good kind of packing stuff, perhaps as good as the mixture of lime with dry materials.

"*What to do with bad potatoes*—When potatoes are only slightly diseased, that is, when the disease shows itself only under the skin in small dark spots, or, at most, spreading into the substance of the potato for about a quarter of an inch deep, with a yellow, or light brown, or blackish colour, and without any smell, they may be eaten by the family without danger. They should be peeled and the diseased parts paired off before they are boiled; the parts cut off should be kept for making starch. Potatoes thus treated are wholesome and palatable, but should be used for food as quickly as possible, as it is not quite certain that they will keep long with the greatest care.

"It is a pity to destroy potatoes for starch if they will otherwise keep. Cut out the diseased parts, if it can easily be done, and dust over the cut parts with lime and the potato also. Get them dry as soon as you possibly can, and if you have outhouses or sheds you should keep the potatoes in them also, using the packing materials. In such cases you should allow the air to circulate freely in the sheds, and frequently examine your potatoes, which should not be laid in layers above two or three feet in height. If you turn them frequently during the first two or three weeks, and keep them very dry in this way, they will probably keep. Although sheds or outhouses are to be preferred, if you have them not and cannot construct them out of cheap materials, you should store the diseased potatoes by themselves, just as we have recommended you to store the sound ones.

"If, with all your care, the diseased potatoes still get worse, dry them thoroughly in kilns, or on hurdles placed over low turf fires, after having cut the potatoes into two or three slices. It is only very bad potatoes that you should break up into starch.

"*How to save the value of very bad potatoes.*—Although nobody knows how to make bad potatoes into good ones, or to prevent many of them from becoming worse, yet it is possible to extract from bad potatoes, or from bad parts of them, a great deal which is good. For this purpose proceed as follows :—Provide yourself with the following things,—a rasp or grater, which may be made out of a sheet of tin, or even of sheet iron bent round, and punched full of holes with a nail—a common coarse linen cloth, or hair sieve, hand sieve, or common cloth strainer—and a pail, or tub or two to hold water.

"To make the bad potatoes useful wash them clean, and then rasp them into one of the tubs of water; the finer they are rasped the more food you will produce from them. Having rasped a good many, take the cloth and place it on another tub, then put the pulp on the cloth and pour water on it, allowing the water to run through. You have now two things to attend to, the pulp and the starch.

"First attend to the pulp; squeeze out as much water as you can from what remains in the cloth. You should wash it, however, till no smell remains. After you have squeezed it pretty dry, complete the drying on a griddle, over a slack fire, and when it is dry put it aside for use.

"Next look to the milky water; it will then become clear, and the milkiness, which is starch, will have settled to the bottom. Pour off the water gently till the starch is tolerably well drained, then add more water, stir the whole well up, and let it settle again. As soon as it is again clear pour off the water, and when you have got rid of as much as you can, put the wet lumps of starch on a shelf or other place to dry. In a few days it will be fit to pack up.

"Good wholesome bread may be made by mixing the starch with the dried pulp, peasmeal, beanmeal, oatmeal, or flour. You must bear in mind that starch is not food by itself.

"There will be, of course, a good deal of trouble in doing all that we have recommended, and perhaps you will not succeed very well at first; but we are confident that all true Irishmen will exert themselves, and never let it be said that in Ireland the inhabitants wanted courage to meet difficulties against which other nations are successfully struggling.

"ROBERT KANE.
"JOHN LINDLEY.
"LYON PLAYFAIR.

"*Board Room, Royal Dublin Society.*"

Among other means suggested for arresting the further progress of the disease when it has attacked the potatoes, the application of chlorine gas has been strongly recommended, and the farmers and labourers have been urged to provide themselves with the ingredients—salt, manganese, and oil of vitriol—for generating this gas. It has been stated that the diseased potatoes, after being immersed in a vessel containing chlorine gas for some hours, may be kept without undergoing further decomposition, and will be perfectly wholesome when cooked in the usual way. We believe, however, that sufficient evidence has not been adduced of the advantage of this process to justify the recommendation of the use of so dangerous an agent as chlorine by inexperienced operators.

The following method of preservation is recommended by Professor Liebig:—"It may be of some use to call attention to the fact, that diseased potatoes may easily, and at little expense, be preserved for a length of time, and afterwards employed in various ways, by cutting them into slices, of about a quarter of an inch thick, and immersing them in water, containing from 2 to 3 per cent. of sulphuric acid. After twenty-four or thirty-six hours, the acid liquor may be drawn off, and all remains of it washed away by steeping in successive portions of fresh water. Treated in this manner the potatoes are easily dried. The pieces are white and of little weight, and can be ground to flour and baked into bread along with the flour of wheat. I think it probable that the diseased potatoes, after being sliced and kept for some time in contact with weak sulphuric acid, so as to be penetrated by the acid, may be preserved in that state in pits. But further experiments are necessary to determine this. It is certain, however, that dilute sulphuric acid stops the progress of putrefaction."

ON THE MEDICAL AND ECONOMICAL PROPERTIES OF THE ANACARDIUM OCCIDENTALE, OR CASHEW-NUT TREE.

W. HAMILTON, M.B.

The cashew-nut tree, or Anacardium occidentale, must not be confounded, from the resemblance it bears to the vulgar name of common cashaws, with trees of a widely different character belonging to the genus Acacia, of which I may perhaps have occasion hereafter to take some notice.

The Anacardium occidentale is known in various parts of the West Indies by a considerable diversity of names, of which the most frequent are, *Acajou* and *Pommier d'Acajou* in the French, and cashew apple (evidently a corruption of the French), and cherry-tree, in the English islands. It is a handsome spreading tree of about twenty feet in height, of quick growth, coming into bearing in the second year from the time of sowing the seed, and continuing to bear fruit for fifty, or even, in some instances, one hundred years. Its timber is hard, close grained, and durable, applicable to many useful purposes. Its trunk and branches yield, on being wounded, during the monthly ascent of the sap, a white and transparent gum, similar in appearance to that of the Acacia vera, or gum arabic. Of this gum, which is subastringent, and furnishes a good substitute for gum arabic, a full grown tree will yield an annual amount of ten or twelve pounds. This gum, being unpalatable to insects, is particularly adapted for use where their depredations require to be guarded against. By tapping the trunk, a milky juice is obtained which stains linen of a durable black, and might serve as a marking-ink. Three varieties occur, one with red, another with yellow fruit, and a third with fruit streaked with red and yellow. That these are mere varieties appears from the statement of Mr. A. Robinson, of Jamaica, who informs us, that the nuts of the red variety, when planted, will produce trees bearing yellow fruit; and those from the yellow variety, trees bearing red fruit.

The fruit, termed by the English planters the cashew apple or cherry, is merely an enlarged succulent peduncle, or receptacle, of a pear shape, and bearing at its extremity a reniform nut, adhering to it by the centre of its convex surface. The former is the apple, the latter the cashew-nut, a luxury not unknown at our own tables. The kernel of this nut is enclosed in a hard shell, covered by a thinner membraneous envelope; and between these resides a thick blackish oil, of such causticity as to blister the lips of those who incautiously suffer it to approach them; on this account these nuts are never eaten till after they have been well roasted to dissipate the oil. After this they may be taken with impunity, and ground up with cocoa, as Lunan states (*Hort. Jam.* i. p. 159), they make an excellent chocolate. Whether Lunan here means the nut of the Cocos nucifera, or of the Theobroma cacao, also called *cocoa*, in vulgar parlance, does not clearly appear.

The caustic oil, of which mention has been made, is useful as an external application, for the removal of freckles and corns, and the cure of malignant ulcers, when diluted with a sufficient proportion of some bland oil; smeared on wood it preserves it from decay, and from the depredations of insects.

The succulent peduncle, which is about the size of a large fig, is an agreeable subastringent fruit, of considerable efficacy as a tonic and diuretic; and Dr. Barham informs us, "that poor dropsical slaves that have had the liberty to go into a cashew-nut walk and eat what cashews they pleased, have recovered." He also states, that "having a large orchard of about three hundred trees, after the market was glutted with them, he distilled a spirit from them far exceeding arrack, rum, or brandy, of which they made an admirable punch that would provoke urine plentifully." Dancer, in his *Medical Assistant*, states, that "the expressed juice of the fruit in red wine sangaree, is good in female weaknesses," and is effectual as a diuretic in dropsies; adding that, "the Portuguese turn their dirt eating negroes out in the cashew season, and *force* them to eat the fruit."

The fruit roasted when ripe and added in slices to punch communicates an agreeable flavour to it; and if the punch thus prepared be bottled, it soon ferments and becomes a delicious sparkling liquor. Advantage has been taken of this readiness to run into the vinous fermentation, to manufacture an excellent wine from this fruit. The earliest notice I can find of this fact is the following, contained in Lemery's *Dictionnaire des Drogues*, where he says, under the head of "POMME D'ACAJOU, cette pomme est d'un jaune rougeâtre, couverte d'une peau mince et tendre, sa chair est spongieuse, empreinte au commencement d'un suc lacteux, acide et astringent; mais sa couleur et le goût de suc se détruisent à mesure qu'il fermente, et il devient vineux, en sorte qu'il enyvre ceux qui en boivent beaucoup." Lunan also observes, in his *Hortus Jamaicensis*, p. 159, published in 1814, that "this juice expressed and fermented makes a fine rough wine, useful where the viscera or solid system has been relaxed." Indeed, the wine so prepared, as I can state from my own personal observation, possesses all the astringency and tonic properties of port wine, and might be made a valuable staple of exportation from our colonies.

But the first individual who can claim the merit of having made this fruit the subject of scientific experiment, was, I believe, my amiable and philanthropic friend, James Webbe Tobin, Esq., of the island of Nevis, whose active and vigorous mind, notwithstanding the disadvantage under which he laboured, of loss of sight, was incessantly occupied with schemes of general utility, calculated to promote the comforts or add to the happiness of his fellow-creatures.

After a number of experiments, attended with a considerable diversity of success, he at last produced a very palatable wine; and, had it pleased Heaven to have spared his valuable life a few years longer to his young family and his fellow-creatures, there can be little doubt that he would have carried the manufacture of this excellent wine to a still higher degree of perfection.

The following is the process which he found to answer best, and which he communicated to me a short time before the premature termination of his valuable life in 1814:

> "Mix two parts of the expressed juice of the fruit with one part of water; putting to every gallon of juice three-and-a-half pounds of the best sugar, and to every gallon of water four pounds: and adding six gills of lime juice for every eight pounds of sugar. Bung the cask down tight before the fermentation has wholly subsided, and fine in the usual way with eggs."

As standing long upon the lees is apt to communicate a disagreeable bitter taste to the wine, not afterwards to be got rid of, it might be an improvement upon Mr. Tobin's plan, to rack it off into a clean cask before the fermentation has wholly subsided, and then to bung the cask tight down; and a further improvement might perhaps be effected by adding some of the extract of the root of the Krameria triandra, which grows in South America, and is employed by the wine-merchants in Oporto to improve the quality and heighten the colour of their port wines. A species of the same genus also, the Krameria ixina, grows in Hayti and St. Kitts, the roots of which, no doubt, possess properties similar to those of the species found upon the Spanish main, the medicinal properties of which were so highly eulogized by the late Dr. Rees, under the name of *Rhatany Extract*. The Krameria ixina, whose existence in St. Kitts has escaped the notice of Swartz, or any other botanist whose works I have met with, was found by me growing on Guinea Corn Hill, at the South Eastern end of the plain of Bassetere, where no doubt it may still be found. In Hayti I met it growing along the foot-path to the deserted plantation Destin, or Tittine, as it is commonly called; the same spot in which I afterwards found it had been previously discovered by the Chevalier Tussax, who has accurately described and figured it in his magnificent "*Flore d'Antilles*."

In making the cashew wine no addition of yeast is required to make the fermentation commence. When new the wine is agreeably sweet and pleasant; but by age it acquires the roughness and much of the flavour of port, a resemblance which would be greatly increased by the addition of the extract obtained from the krameria.

The subjoined table, which I have calculated from Mr. Tobin's directions, exhibits the relative quantities of water, sugar, and lime juice, for various quantities of cashew juice, and may facilitate future experiments.

Cashew Juice.	Water.		Sugar.		Lime Juice.		
Galls.	Galls.	Qts.	lbs.	oz.	Galls.	Pints.	Gills.
2	1	—	11	—	—	2	2/8
4	2	—	22	—	—	4	1/2
5	2	2	27	8	—	5	5/8
8	4	—	44	—	1	—	1
10	5	—	55	—	1	2	1 2/8
12	6	—	66	—	1	4	1 1/2
14	7	—	77	—	1	6	1 6/8
15	7	2	82	8	1	7	1 7/8
20	10	—	110	—	2	4	2 1/2
25	12	2	137	8	3	1	3 1/8
50	25	—	275	—	6	3	2 2/8
60	30	—	330	—	7	5	3 1/2
70	35	—	385	—	9	—	6/8
80	40	—	440	—	10	2	2
100	50	—	550	—	12	7	1/2

By bottling it before the fermentation has wholly subsided, a pleasant sparkling wine may be obtained, more agreeable even than champagne.

In one instance, in which a quantity of this wine was made by a friend, according to Mr. Tobin's receipt, the process appeared to have failed, and the produce was bottled off, under the impression that it might be converted into good vinegar; but, on opening one of the bottles many months after, when some vinegar was required, my friend was agreeably surprised to find, on drawing the cork, that, in place of vinegar, he had a bottle of most delicious sparkling wine. In fact, it had been bottled somewhat too soon, while the process of fermentation was still going on, although in a reduced degree, and thus the escape of the carbonic acid, which continued to be generated, was prevented. How long the wine, bottled in this state of fermentation, could be kept without running to the acetous fermentation, remains to be determined by experiment.

The cashew-tree being easily raised from seed, coming into bearing within twenty-five months from the time of sowing, bearing its fruit in profusion, and continuing to bear abundantly for a long succession of years, there can be little doubt, that if a market could be found for its products, its cultivation would soon attract a degree of attention not hitherto accorded to it. These products are, 1. The gum which exudes from the wounded bark, of which between 3 and 4000 pounds might be annually obtained from a plantation of only 300 trees. This gum, from its sub-astringency, possesses many advantages over that of the Acacia vera, for a variety of purposes, those especially, in which it is desirable to guard against the depredations of insects, to whom this astringency is repulsive. 2. The leaves, which in decoction, form a good lotion for bad ulcers. 3. The milky juice, which is obtained by tapping the trunk, and which, as Long suggests, might probably be converted, by evaporation, into a valuable varnish. 4. The caustic oil obtainable from the nuts, which is so valuable as a preservative of timber from the assaults of insects, and probably also from the growth of those fungi which occasion what is commonly called *dry rot*, and when mixed with tar, would, in all likelihood, be found useful for covering the bottoms of ships. As an escharotic, it forms, when carefully applied, a good remedy for the removal of callosities, such as warts and corns; and as a stimulant application, may be employed to restore a healthy action in cases of herpes, ill conditioned ulcers, &c., being first diluted to the proper degree with some mild oil. Similarly diluted, but to a still greater extent, it becomes a safe and certain cosmetic, by exciting an inflammatory action, which produces desquamation of the cuticle. Two young women of colour in Nevis, anxious to improve their complexion, employed this oil without due caution, and excited a degree of inflammation so violent, as to cause intense suffering, and endanger their lives; by careful and judicious treatment, however, the inflammatory action was conducted, at the end of about five or six weeks, to a happy termination, and the vanity of the young ladies amply gratified by the brilliancy, clearness, and beauty of their new complexion. Whether they had occasion, or felt an inclination to repeat the experiment, I was not fortunate enough to learn. 5. The spirituous liquor which may be obtained by distillation from the fruit, and which, according to Dr. Barham, possesses the same diuretic properties as the best Hollands; and, 6. The wine prepared from the fermented juice expressed from the fruit, and which, if improved by the addition of a due proportion of the extract of the roots, either of the Krameria triandra, which is found on the Spanish main, or the Krameria ixina (which I found near the ridge of Guinea Corn Hill, to the east of the ponds of Basseterre, and may exist in other parts of the island which I had not an opportunity of examining) and kept in bottle for some years, would equal in flavour the best port of Oporto, and not improbably combine, with the tonic and astringent properties of the Portuguese wine,—properties to be chiefly ascribed to the krameria extract, or "wine colouring," added to it by the merchants—those diuretic properties which so strongly characterize the fruit of the anacardium in its recent state. To these products may be added a 7th, the nuts, which, after the separation of the caustic oil, would be found desirable additions to an English dessert. And, 8th, The timber of the trees, after they have ceased to bear, and which, from its strength and durability, is extremely valuable.

Hence it is perhaps questionable, whether an acre of land planted with cashew trees (which demand little of human labour, and that of the least exhausting kind, and are not exposed to the innumerable casualties of the cane) would not be found to yield a net produce, upon an average of years, superior to that of sugar—especially as land no longer suitable for the cane, might be still rendered productive as a cashew orchard.

14, *Octagon*, *Plymouth*, *June* 21*st*, 1845.

ACTION OF PURE AND CONCENTRATED SULPHURIC ACID ON DISULPHATE OF QUININE AND SOME ORGANIC COMPOUNDS.

1. *Disulphate of Quinine.*—The acid allowed to digest in a small tube at the common temperature for forty-eight hours with a few grains of disulphate, had undergone no change: the salt was dissolved; on boiling, the liquid became dark coloured from partial carbonization. When the acid and disulphate were openly exposed in a porcelain saucer for the same period, there was no discolouration not even on boiling: sufficient water had been absorbed to prevent the usual carbonizing action. It was found that a small

quantity of sugar might be added to this acid liquid without its presence being indicated by any change of colour. On increasing the sugar to one-fourth of the bulk of the disulphate, the liquid acquired a reddish colour, passing to a red brown, and this was not changed to a black colour until the sugar was added in comparatively large quantity. Gum and starch added in rather large proportion gave on boiling, with a portion of the acid liquid only, a straw-yellow tint.

Another specimen of pure disulphate similarly treated gave similar results.

Cold sulphuric acid was then poured on the crystallized disulphate, mixed with about one-fifth part of sugar in a porcelain saucer. In about half an hour the liquid had acquired a slight brown tinge, but after forty-eight hours' exposure, it was impossible to distinguish the contents of this saucer from the mixture of pure disulphate and sulphuric acid. On boiling, the liquid acquired a dark reddish brown colour.

When the quinine was mixed with one half sugar, and allowed to digest with the cold acid forty-eight hours, the liquid had become perfectly carbonized.

Two specimens of pure disulphate of quinine, boiled with sulphuric acid, were immediately and completely carbonized.

Sulphuric acid, diluted with *twice its bulk* of water, produced no change of colour in the cold, on the pure disulphate. On boiling it (Dr. Nevins' test), there was scarcely any perceptible change of colour. On adding a small portion of sugar, a red, and, on increasing the quantity, a brown and black tint was successively brought out. Similar results were obtained with gum and starch, although in equal quantities not in so decided a manner as with sugar.

Sulphuric acid does not easily clear all organic compounds; and if diluted with twice its bulk of water there are some which are not even carbonized on boiling. Sugar, gum, and starch, allowed to digest in cold sulphuric acid, gave the liquid a brown tint in half an hour, and it was perfectly blackened in forty-eight hours. When either of these substances was boiled with sulphuric acid, an immediate blackening took place.

2. *Citric Acid.*—The powdered acid, digested with sulphuric acid forty-eight hours, had undergone no change of colour; in one experiment it acquired a light yellow tint; on boiling the liquid, it became of a light brown colour, but there was no decided carbonization. When the sulphuric acid was diluted with twice its bulk of water, there was no change either in the cold after seventy-two hours, or on boiling. The citric acid was merely dissolved.

3. *Tartaric Acid.*—*Bitartrate of Potash.*—*Binoxalate of Potash.*—The results obtained with sulphuric acid, diluted with two parts of water, were precisely the same as with the citric acid. There was no carbonization either in the cold or on boiling, unless a portion at the edge of the tube happened to be suddenly heated to dryness.

4. *Gallic Acid.*—This acid digested in cold sulphuric acid forty-eight hours, acquired a light yellow colour, but it was not carbonized. On boiling the mixture the well known crimson colour (not black) was brought out. In this respect gallic acid is the reverse of salicine. Salicine is turned of a crimson red by cold sulphuric acid, but carbonized on boiling.

5. *Benzoic Acid.*—Cold sulphuric acid acquired a light pinkish tint by standing on the crystals forty-eight hours; on boiling, the benzoic acid was dissolved, and the liquid acquired a somewhat deeper colour, but there was no decided carbonization. When the gallic and benzoic acids were treated with sulphuric acid diluted with twice its bulk of water, the effects were much less marked.

The following experiment was then performed:—a few grains of crystallized disulphate were boiled in one part of acid and diluted with two parts of water. The crystals were dissolved, but they were not carbonized.

Tartaric acid was then added, until its bulk was equal to that of the disulphate employed, but there was no change of colour; the acid was merely dissolved. Citric acid and bitartrate of potash were substituted for tartaric acid with similar results. On adding a small portion of sugar, the liquid in a few minutes acquired a reddish tint, which became deeper by standing; but which did not acquire a black colour until the sugar was added in very large proportion. From these results it appears:

1. That boiling sulphuric acid easily carbonizes pure disulphate of quinine.
2. That cold sulphuric acid does not readily carbonize it.
3. That sulphuric acid diluted with twice its bulk of water, does not readily carbonize it, either in the cold (after forty-eight hours), or on boiling.
4. That cold concentrated sulphuric acid exposed in an open vessel, will not detect the presence of sugar in the disulphate, when the sugar is in small proportion.
5. That sulphuric acid diluted with two parts of water, will give a red, brown, or black colour, on boiling with sugar, gum, or starch, according to the quantity of those substances present.
6. That sulphuric acid either concentrated or diluted as above, does not carbonize several organic compounds (citric and benzoic acids—tartaric acid and bitartrate of potash), either on standing in the cold for forty-eight hours, or on boiling.*
7. That therefore sulphuric acid cannot be regarded as a test for "organic adulteration" in disulphate of quinine. It will only, under proper precautions, serve to detect the presence of a certain amount of sugar, gum, or starch, in the disulphate.

The process is obviously beset with many fallacies. By trusting to it, a specimen of disulphate largely adulterated with tartaric or citric acid, or cream of tartar, might be pronounced pure. It is true that there are other ways in which these impurities may be detected, but then it follows, that sulphuric acid cannot be a sufficient test for "*organic adulterations*," and to employ it for the detection of *sugar*, great care must be taken not to dilute it with too much water. On the other hand, if the water be in too small a quantity, the pure disulphate itself will become carbonized. After all, the plan recommended by Dr. Pereira appears to us to be the best. Precipitate the quinine by carbonate of potash, evaporate the liquid to dryness, and digest the residue in rectified spirit—this will dissolve the sugar and leave the sulphate of potash.—*Medical Gazette.*

CHEMICAL COMPOSITION OF THE YOLK OF EGG.

BY M. GOBLEY.

When yolk of egg, deprived of the greater part of the water which it contains, is treated with ether or boiling alcohol, there is obtained, on the evaporation of the liquid, first, *a fixed oil*, known by the name of *oil of egg;* second, a substance of a soft and viscous consistence, which I shall designate by the name of *viscous substance*. It is in this latter substance that the oleic, margaric, and phosphoglyceric acids are found.

The viscous matter does not affect litmus; it leaves, on calcination, an acid ash which cannot be burnt in consequence of the phosphoric acid thus recovered; it mixes with water and forms a kind of emulsion, which does not become acid by a prolonged ebullition; it is soluble in ether; it dissolves in boiling alcohol, from which it precipitates, in great part, on cooling.

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* Tartaric acid and the bitartrate were not carbonized by digestion with cold sulphuric acid, but speedily on boiling. Tartaric acid differs in this respect from citric acid.

It is essentially formed of oleic, margaric, and phosphoglyceric acids, which are combined with ammonia, and form a true soap. This soap appears to be enveloped in an azotized organic matter, the nature of which I was for some time unable to determine. It is certainly with ammonia that the acids of which I have spoken are combined, for the viscous matter, triturated with solution of potash, gives off very sensible quantities of ammonia. Moreover, sixty grains of this substance, dried at 248° Fahr., scarcely leaves, on calcination, seven grains of residue, which does not contain any sensible traces of potash or soda.

The presence of an ammoniacal soap in the yolk of egg deserves the attention of physiologists, for up to the present time the oleic and margaric acids have only been found in the human body in combination with soda.

The oleic and margaric acids may be separated from the viscous matter by decomposing it with diluted mineral acids. For this purpose the viscous matter should be shaken in a bottle with weak hydrochloric acid, and heated over a water-bath. It separates into three layers—the highest, oily; the lowest, watery and a little coloured; the middle one, very thin, and formed of small pellicles of a grayish colour.

The oily layer may be separated by means of ether, and the grey pellicles by collecting them on a filter.

The oily matter consists of oleic and margaric acids, and a small quantity of oil of egg, which had remained mixed among the viscous matter, and from which the fatty acids may be separated by means of boiling alcohol.

The fatty acids may be purified in the usual way; margaric acid has not been obtained fusible at a higher temperature than 137° Fahr., but treated by the process of Gusserow it fuses at 140°, and has a composition similar to that found by Varrentrapp for the same acid purified by similar means; the oleic acid possessed all the properties which Chevreul has ascribed to this body.

The gray matter is formed of the *débris* of the network which holds together the viscous matter; it contains nitrogen and sulphur; it dissolves in hydrochloric acid, colouring it blue or violet, and appears to be different from *vitelline*.

The liquor does not contain phosphoric acid, but does contain a phosphorized body, which may be separated by means of neutral acetate of lead; the precipitate which is thus formed is a compound of the phosphorized substance with oxide of lead. This compound may also be obtained by heating the viscous matter with solution of potash, decomposing it with acetic acid, filtering it to separate the fatty acids and azotized matter, then adding to the liquor neutral acetate of lead.

To obtain the phosphorized acid, the lead precipitate must be washed, and decomposed by sulphuretted hydrogen; the filtered liquor always contains, besides the phosphorized body, a small quantity of acid phosphate of lime, resulting from the phosphate of lime contained in the viscous matter. The two substances are separated by means of lime-water, which is added to complete saturation. The phosphate of lime being separated by filtration, a liquid is obtained which contains only the phosphorized acid combined with lime.

The lime may be separated by means of oxalic acid, and the phosphorized acid obtained by evaporating the liquor. It may be concentrated to a certain degree, beyond which it is found to contain phosphoric acid, resulting from the decomposition of the phosphorized matter. On concentrating the liquid in *vacuo* over lime, an acid may be obtained, in the form of a thick viscous and uncrystallizable liquid, having a strong acid taste, very soluble in water and in alcohol. It does not contain phosphoric acid, and it leaves an acid residue on calcination. It has much analogy with phosphorinic acid; like that body, diluted with many times its volume of water, it is not decomposed by prolonged ebullition; but is decomposed if thus treated when at its highest state of concentration.

This acid has not been directly analysed. Its composition has been deduced from its combination with lime.

The *salt of lime* is obtained by evaporating the liquor which holds it in solution. It is one of the small number of salts more soluble in cold than in boiling water. Thus the liquor in evaporating is covered with the salt. Separated from the boiling liquid it has the form of micaceous plates of a beautiful white. It has no smell; its taste is slightly acrid; it is not decomposed at a temperature of 302° Fahr. When calcined it blackens, and if the action of the fire is continued, assisting the decomposition by nitric acid, a white residue of phosphate of lime is obtained. Alcohol does not dissolve it; on the contrary, it precipitates it from its aqueous solution.

The composition of this salt is very remarkable. The agreement of the numbers deduced, from the carbon and hydrogen resulting from its combustion with chromate of lead, and from the capacity of saturation of the salt of lime, controlled by the conversion of the phosphate of lime resulting from the calcination of the salt into bone-ash phosphate of lime, induce me to consider the phosphorized acid united to the lime, as containing the elements of glycerine and phosphoric acid. The conversion of this acid into glycerine and phosphoric acid by lime leaves no doubt on this point, and justifies me in considering the phosphorized acid of yolk of egg as phosphoglyceric acid.

The whole of my analyses agree with those of the phosphoglycerate of lime artificially prepared by M. Pelouze, in whose laboratory all my analyses have been made, and whose advice has been of great assistance to me in these investigations.

The presence of oleic and margaric acids in the yolk of egg is not remarkable, as these bodies are found in almost all parts of the animal organization —in the brain, the blood, and the bile; but this is not the case with phosphoglyceric acid.—*Comptes Rendus.*

NEW ENDIOMETRIC PROCESS FOR DETERMINING, BY VOLUME THE CONSTITUENTS OF ATMOSPHERIC AIR.

BY M. LASSAIGNE.

Since the discovery of the composition of air, various means have been employed by Chemists, to determine the proportions, by volume, of the constituent principles of this elastic fluid. These processes, as generally practised in chemical laboratories, are all founded on the absorption of oxygen by certain simple or compound bodies, either at ordinary temperatures, or by inducing re-action by heat or electricity. Thus, solution of sulphuret of potassium was formerly used, subsequently, phosphorus, hydrogen, binoxide of nitrogen, and within the last few years, protosulphate of iron decomposed by potash.

Messrs. Dumas and Boussingault, in submitting air to the action of copper turnings, heated to dull redness, have lately introduced an important modification of the process, by which the weight of the oxygen and nitrogen existing in the air, may be determined, instead of the volumes of these gases, which were indicated by former endiometric processes.

In experimenting lately with the protosulphate of iron, recommended by M. Dupasquier, and repeating the process which he has published, I have been induced to adopt a reaction, well known to Chemists, but which has not been applied, to my knowledge, to the analysis of air.

This process is founded on the facility with which metallic copper, in thin turnings, oxydizes in contact with air and liquid ammonia; when a blue compound of ammonia and binoxide of copper is formed.

Several successive experiments having proved that this reaction, when effected in a limited volume of air, causes, in a short space of time, the total absorption of the oxygen, leaving the nitrogen free, it occurred to me that this process might be applied to the analysis of air, and the result has been such as I anticipated.

The application of this new process is very simple, and does not require the use of any peculiar apparatus. A common graduated tube, four or five inches long, and half an inch in diameter, and a small stoppered flask, of from ten to twelve cubic inches capacity, are the only necessary utensils.

The process consists in introducing into the flask from forty to sixty grains of copper turnings, then to half fill the flask with distilled water, and to fill it up with a concentrated solution of ammonia. The flask thus entirely filled is closed with the stopper, and inverted in a pneumatic trough, taking care that the copper turnings are not deposited on the orifice of the flask. This arrangement being completed, measure in the graduated tube, previously filled with water, a certain volume of air, and by means of a small glass funnel, introduce it into the flask, the mouth of which has been opened under water. This being accomplished, the flask is again to be stopped, removed from the pneumatic trough, and constantly shaken for eight or ten minutes. In less than a minute or two, the ammonia will assume a blueish tint, which becomes more and more dark as the ammonia combines with the binoxide of copper formed. This blue tint soon assumes its maximum intensity, in operating on five or six cubic inches of air: the colour then becomes by degrees more faint, when all the oxygen of the volume of air which has been operated upon, has been absorbed. This gradual decolouration, which indicates the termination of the process, is due to the re-action of the excess of copper on the compound of ammonia and binoxide, which is transformed into a colourless compound of ammonia and protoxide.

Having proceeded thus far, the gaseous residue is to be passed again into the graduated tube, to be measured, taking the precautions indispensable in these operations. In several experiments in which I have employed this process, I have found that the gaseous residue, after the action of the copper and ammonia, has not contained any oxygen, as the phosphorus introduced for the purpose of detecting it, has not shown any phosphorescence in the dark, nor produced any diminution of volume.

The volume of nitrogen gas determined by this process has always been two or three-tenths of a degree greater than that obtained by the action of phosphorus on air. The proportion has been : : 79 : 79.22. This last number, the result of my experiment, approaches very near to 79.17, which Messrs. Dumas and Boussingault have deduced from the analysis of air by the process of weighing.

In the analysis of an artificial mixture, composed of 41.5 of air, and 57.5 of nitrogen gas, in which the proportion of nitrogen is consequently increased to 90.2, the new process has given the proportion of nitrogen as equal to 90.

The simplicity of this operation, and the quickness with which the process is conducted, will no doubt cause it to be applied under many circumstances. —*Comptes Rendus.*

THE ACIDS CONTAINED IN THE PINES.

BY M. LAURENT.

Recent researches have convinced me that the natural acid of the pines is the *pimaric acid*. This compound, either with lapse of time, or from the influence of certain agents, is transformed into two isomeric compounds, *pinic* and *sylvic acid*. It is erroneously stated in treatises on Chemistry, that sylvic acid crystallizes in quadrilateral tables. Its form is very remarkable, and offers sufficient means at once to recognise this acid; the crystals have the form of triangular tables. It is this error which prevented my recognising the identity of the *sylvic* and *pyromaric* acids. The amorphous *pinic* and *pymaric* acids are probably identical. The *pinic* and *sylvic* acids, which are met with in the resins of commerce, are the result of modifications which the natural or *pyraric* acid undergoes with the lapse of time, or from the influence of fire or of light.—*Comptes Rendus.*

ON THE SOLUBILITY OF OXIDE OF LEAD IN PURE WATER.

BY LIEUT.-COL. PHILIP YORKE.

In the *Philosophical Magazine* for August 1834, I published a paper on the action of water and air on lead. Some of the principal results contained in it were confirmed by Bonsdorff in two papers; he found that 7000 parts of pure water, free from access of carbonic acid dissolved one of oxide of lead; my experiments gave $\frac{1}{12000}$th to $\frac{1}{16000}$th. Since that time two papers have appeared on the same subject, one by Dr. Christison[*], and one by Mr. R. Phillips, Jun.[†] The last-named Chemist considers that the oxide of lead is not dissolved, but merely mechanically suspended in the water, because the liquid is deprived of the lead by passing it through a paper filter. It is to this opinion that I propose to direct attention in the present notice.

The fact that the aqueous solution of oxide of lead would not pass through a filter was noticed by me in the paper already referred to; but as the action of tests on the liquid was just what one observes with solutions; as no time allowed for subsidence made any difference in these appearances; as the liquid deposited crystals of oxide of lead not only on the lead but on other bodies; as when decomposed by the voltaic battery it gave metallic lead at the negative pole, and peroxide at the positive; I did not consider that the stoppage of the oxide of lead by the filter was any proof of its not being dissolved. There still however remains this question to be answered,—In what way does the paper act in retaining the oxide? and I think that the following experiments afford an answer to the question.

I placed some clean rods of lead in bottles of distilled water loosely stopped; in this way, after removing the rods of lead, I obtained a clear liquid, which, when tested by sulphuretted hydrogen, gave a deep brown colour. On passing this liquid through a double filter, which had been previously washed with hot distilled water, it appeared to be very nearly deprived of lead: when two or three fluid ounces had passed through, the filters were removed, washed, then immersed in a solution of sulphuretted hydrogen, again washed and dried. Some torn fragments of the filters were then mounted in Canada balsam for examination by the microscope. On examination with powers of from 150 to 400, the fibres of the flax composing the paper were seen to be browned, and in many instances it could be distinctly observed that the colouring substance occupied the interior of the tubular fibre. Now it is stated by Mr. Crum in the *Philosophical Magazine* for April, 1844, that cotton wool possesses the power of abstracting the oxide of lead from its solution in lime-water, and that this property is made available in the processes for dyeing cotton with the chromates. I found that on filtering a solution of oxide of lead in lime water through a triple filter, that whereas the original solution gave a deep black when tested by sulphuretted hydrogen, the filtered liquid gave but a pale brown; and it required that the unfiltered liquid should be diluted with thirty times its volume of water to produce the same test as the filtered.

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[*] *Transactions of the Royal Society of Edinburgh.*

[†] *Pharmaceutical Journal* for December, 1844.

I then tried the effect of mere immersion of the paper in the aqueous solutions before used. A bit of filtering-paper ten inches by two inches was boiled in distilled water and then put into an ounce phial filled with the aqueous solution; after remaining six hours the liquid was poured off and tested: it gave a pale brown, and it required that the liquid which had not been in contact with the paper should be diluted with ten times its volume of water to produce the same tint. This experiment was repeated with a stronger solution of oxide of lead in water, the water was poured off at the end of four hours; it then gave a pale brown, and it required that the original liquid should be diluted with four times its bulk of water to produce the same tint. A fresh portion of the same solution was then poured on the same paper and left for a night; then, on testing, the liquid gave a brown tint, barely perceptible, and it required that the original liquid should be diluted with from fifteen to twenty times its volume of water to produce the same.

From these experiments it is clear that the effect in question is dependent on a power possessed by the paper in common with several other porous bodies and organized fibres, of separating certain substances from their solutions, a power sufficiently well known, though little understood*. In considering this view of the subject in the present instance, there is a circumstance of some practical importance which it would appear ought to follow; viz., that after the fibres of the paper had been saturated with the oxide of lead, then this substance should pass through in solution. To ascertain whether this was the case, I made the following experiments:—

I obtained a strong aqueous solution of oxide of lead by immersing slips of clean lead in about three quarts of distilled water, contained in a two-necked bottle, through which oxygen gas was passed and maintained in contact with, under a slight pressure. In this manner I procured a solution, which, when quite clear yielded $\frac{1}{7500}$th of ignited oxide of lead. A filter of paper rather less than $\frac{1}{200}$th of an inch thick and four inches in diameter was prepared and washed; then, by fitting into one of the two necks of the bottle a siphon with equal legs, so as to resemble Gay-Lussac's apparatus for washing filters (except that I used a contrivance to prevent the necessity of the air supplied to bottle from bubbling through the solution), I was enabled to allow the filtration to go on with considerable regularity for many hours. The first portion of liquid which passed through gave a pale brown when tested; when nine fluid ounces had passed through the effect was the same as at first, and a portion (*a*) was reserved for future comparison. When forty fluid ounces had passed through, the liquid, which was quite clear, gave a much darker tint with the test than any which had previously been obtained in the experiment. It gave a tint about equal to that given with the unfiltered liquid when diluted with its own volume of water; while it (*i. e.* the last filtered portion) required to be diluted with twice its volume of water to produce the same tint as that given by the reserved filtered portion (*a*). The liquid now passed through the filter very slowly; it was tested again, when eight more fluid ounces had passed through, with the same result as before, except that the tint was a trifle darker.

This experiment sufficiently shows that the effect contemplated does occur, and that it would be unsafe to trust to the action of a filter to separate oxide of lead from water for an unlimited time.—*Memoirs of the Chemical Society.*

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* The effective filter mentioned in Dr. Clark's Notice, page 384, is formed of well-washed sand, and has been in use during twelve months without any apparent diminution of power.

NEW PROCESS FOR CARBONIC OXIDE.

BY M. PILHOL.

In a memoir recently published on lactic acid, M. Pelouse has pointed out the following curious reaction:—If a mixture be made of lactic acid and concentrated sulphuric acid, the latter being in great excess, and the mixture slightly warmed, an abundant disengagement of pure carbonic oxide will take place.

Considering the similarity of composition which exists between lactic acid and sugar, I thought it not impossible that a similar reaction might take place if sugar were substituted for lactic acid.

The formula for crystallized cane sugar, is $C_{12} H_{11} O_{11}$, while that for two atoms of lactic acid is $C_{12} H_{12} O_{12}$. Thus, if from the elements of two atoms of lactic acid, the elements of one atom of water be subtracted, there will remain the formula for crystallized cane sugar.

If it be admitted with M. Guerin Varey, that the formula for anhydrous sugar of fecula is $C_{12} H_{12} O_{12}$, it would appear that two atoms of lactic acid contain exactly the elements of one atom of anhydrous starch sugar.

I treated twenty grammes (308 grains, Troy) of cane sugar with eighty grammes (1232 grains, Troy) of concentrated sulphuric acid in a matras; the mixture being kept slightly heated, a brisk reaction is soon manifested, an abundant disengagement of gas takes place, the mass swells up, becomes blackened, and ultimately nearly solid; the operation is now to be stopped. I collected in this way about two *litres* (3½ pints imperial) of gas.

This gas consisted, as far as I could determine by the analysis I made, of a mixture of carbonic acid and carbonic oxide, the carbonic acid constituting about one-fifth part in volume, but the composition of the mixture varies somewhat with each operation.

The gas when deprived of the carbonic acid by washing it with lime water, is colourless, and produces no reaction on litmus paper. It is decomposed at a red heat by potassium, which absorbs oxygen, and causes a deposit of charcoal; it burns with a pure blue flame; I have determined by endiometric analysis that it consists merely of carbonic oxide.

Sugar of starch and fecula afford similar results. As will be seen, the reaction of sulphuric acid on sugar or on starch differs from that of the same acid on lactic acid, for with the latter, pure carbonic oxide, unmixed with carbonic acid is obtained, but the separation of the carbonic acid is so easy, that considerations of economy would always indicate the use of sugar.—*Journal de Pharmacie.*

NOTE ON THE EXISTENCE OF PHOSPHORIC ACID IN THE DEEP-WELL WATER OF THE LONDON BASIN.

BY THOMAS GRAHAM, ESQ., F.R.S.

This water is obtained on piercing the London clay, which forms an impervious bed, generally exceeding 200 feet in thickness, and flows from fissures in the subjacent chalk. It is always highly soft and alkaline, and remarkable for the predominance of soda salts over earthy salts among its solid constituents. I have never found it to contain a sensible quantity of potash, although salts of the vegetable alkali appear among the constituents of the water of the deep Artesian well of Grenelle.

When evaporated considerably, a small deposit takes place in the London deep-well water, which consists chiefly of carbonate and phosphate of lime. The remaining liquid gives with nitrate of silver a precipitate of chloride and carbonate of silver, which is white without any shade of yellow; but if a portion of the water, amounting to an ounce or two, be evaporated to dryness in a platinum capsule, without removing the precipitate, and the heat afterwards continued so as to raise the temperature of the resulting dry saline matter to low redness, then, on redissolving by distilled water, and adding nitrate of silver, a precipitate is obtained, in which the yellow colour of the phosphate of silver is very perceptible. The earthy phosphate is decomposed by ignition with the alkaline belonging to the water, and the soluble phosphate of soda is produced.

The following are the results of the analysis of the water from the deep well in the brewery of Messrs. Combe and Delafield, Long Acre. An imperial gallon of the water contained 56.45 grains of solid matter, 100 parts of which gave—

Carbonate of soda	20.70
Sulphate of soda	42.94
Chloride of sodium	22.58
Carbonate of lime	10.96
Carbonate of magnesia	1.92
Phosphate of lime	0.34
Phosphate of iron	0.43
Silica	0.79
	100.66

The growth of green confervæ in this water is extremely rapid, and occasions inconvenience when the water is kept in open tanks. It is a subject perhaps worthy of inquiry, whether the value of some waters for irrigation may not depend upon their containing phosphoric acid, this constituent having hitherto been generally overlooked in waters.—*Memoirs of the Chemical Society.*

REVIEWS.

MÉMOIRE SUR L'ERGOT DU SEIGLE, *et sur quelques Agames qui vivent Parasites sur les Epis de cette Céréale.* Par A. L. A. FÉE. *Premier Mémoire. Strasbourg.* [MEMOIR ON THE ERGOT OF RYE, *and on some of the Parasitic Agamia which grow on the spike of the Rye.*]

IN noticing the present memoir of the celebrated French cryptogamic botanist, Fée, we think we shall best consult the advantage of our readers by confining our notice of his work to the opinions which he advocates respecting the nature and origin of ergot;—opinions which we believe to be in opposition to those generally entertained by naturalists in this country.

Ergot, according to Fée, consists of two distinct and readily separable parts: one is external, and constitutes the fungus called by Léveillé *sphacelia;* the other is internal, and is a pathological production, being the altered caryopsis, or young fruit: this is termed by Fée the *nosocarya* (from *νοσος a disease,* and *καρυον a nut*).

The *sphacelia* is composed of filaments and sporidia, forming a thin layer applied over the whole surface of the disorganised ovary. This layer is superficial, violet, and adherent to its support, from which, however, it may be partially removed by water. The sporidia are found accumulated in the ovarian box detached from its base, and become terminal: to this part Fée applies the name of *sacculus.*

The *sacculus,* like the rest of the sphacelia, consists of tissues and sporidia. The upper part has also hairs, which, in the normal state, crown the ovary: this part is only moderately altered, and it is the only one; the tissue is hexagonal, and is preserved intact. Beneath this tissue is found the *thallus* of the fungus, composed of very slender, colourless, somewhat undulated, very slightly branched filaments, which, when magnified 250 times, do not appear to be jointed. This sacculus is dirty white, adheres feebly to the nosocarya, and supports itself merely by a small number of prolongations, the points of insertion of which can be readily perceived. When we place it in contact with water, and remove the sporules by this liquid, there remains only a fibrous somewhat spongy mass, composed of the fungic tissue, and of the tissue of the epicarp, which has been raised, and more or less completely destroyed. If we carefully remove the envelope of the sacculus, we find that it contains a sporulescent, very resisting, cerebriform, or slightly yellow mass exclusively formed of sporidia. This part is called the *glomus*. The sacculus is not an essential part, since it is not found in the ergots of all glumaceous plants.

The fibrous texture of the ergot is entirely composed of filaments disposed longitudinally: these are very firm, and olive-coloured; and are placed on an external tissue of the nosocarya, which acts as a *stroma* or support. They receive in their meshes a certain number of sporidia and of rounded monadic [*monadaires*] bodies, which cover its entire surface, and thus form a continuous layer, separable, towards the base of the ergot, as a delicate membrane.

If we imagine the *sphacelia* to be entirely detached from the *nosocarya*, we should have a sort of fine, violet, continuous sheath, terminated by a kind of small pocket: the form of the sheath would necessarily be that of the body which supported it.

The sporidia are found exclusively in the *sphacelia;* no trace of them existing in the *nosocarya*. They are elliptical, semi-transparent, and present, sometimes at their centre, sometimes at their extremities, two small globular points, which are frequently very apparent. Their size is very uniform. They are endowed with movement.

A considerable number of monadic corpuscules of variable diameter, but in general very small, is found mixed with the sporidia, and occupying the mass of the nosocarya. They are mobile, but, unlike the sporidia, they merely execute movements of rotation confined to an ellipse having a very short focus.

The *nosocarya* constitutes the mass of the ergot whose form it necessarily has. It is traversed by a small number of perpendicular, moderately branched minute veins. Under the fungic tissue of the *sphacelia* is a cellular tissue with polymorphous meshes, which can be readily isolated. This tissue extends to the interior, and forms a loose network, in the midst of which are found some grains of fecula altered*, and not contained in the fusiform cells in which is found the fecula of the perisperm in a healthy state. Those grains of fecula which have lost their characteristic properties are accompanied with an immense quantity of mobile monadic corpuscules, the movement of which is at times so remarkable, that the granular mass appears as if trembling. After desiccation the movements recommence, and so on as often as the corpuscles are dried; in which circumstance they differ from true infusoria, which, notwithstanding what has been written to the contrary, always die when the water in which they lived has evaporated.

Fig. 1.

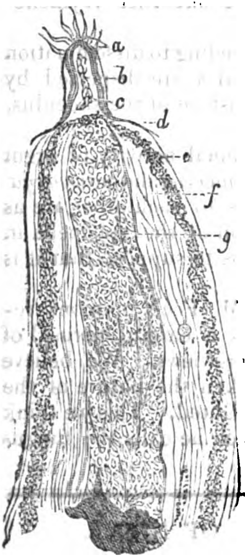

Fig. 2.

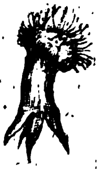

Fig. 3.

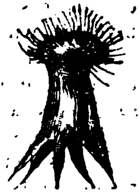

Fig. 1.—Perpendicular section of an ergot magnified. *a* the summit of the *sacculus*, crowned with hairs, which, in the normal state, are found on the upper part of the ovary; *b* tissue of the *sacculus*; *c* the *glomus*; *d* prolongations by the aid of which the *sacculus* adheres to the *nosocarya*; *e* exterior layer of sporidia belonging to the sphacelia; *f* fungoid filaments constituting the thallus of the sphacelia; *g* the mass which constitutes the *nosocarya*, it is traversed by very distinct small veins; *a-f* refer to the sphacelia; *g* to the nosocarya.

Figs. 2 and 3.—*Sacculus* detached from the ergot and magnified six times.

The *nosocarya* is hard, and justifies the name of *sclerotium*, which the entire ergot bears. It is white, sometimes spotted with very pale violet, or even greyish; it is inodorous, and has little taste. It breaks short and with noise, and remains in water without either losing or gaining in bulk, but it becomes soft; it presents everywhere apparent veins, especially when the ergot has been put in contact with a liquid.

The bodies analogous to globules which are found in the *nosocarya*, exist in fecula, and authors think that they are very small molecules of fecula (Raspail). Is this assertion true? Are not these bodies analogous to those of lignine?

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* In a note at the end of the Memoir the author corrects this statement, and observes that the altered grains of fecula above referred to, have suffered a very profound alteration, and, strictly speaking, have changed their nature, for iodine produces no effect on the *nosocarya*. Moreover, these altered grains are very few in number, and even a trace of them is not found in some ergots.

Traces of the perisperm and of the embryo have been in vain sought for in the *nosocarya* both externally and internally: they have disappeared.

It is difficult to determine what part of the embryo was first affected.

The viscid liquor which flows from the diseased ovary is not the nascent fungus, but comes from it. The perisperm of the ovary is submitted to a morbid action which changes it in its elements, very nearly as does the act of germination.

The *sphacelia* is an entophyte fungus, but cannot be placed among the Coniomycetes of Fries. It may be put among the Hyphomycetes, though, if the *nosocarya* be regarded as part of the fungus, the tribe Sclerotiacei (of the suborder Hymenomycetes, will claim it).

It is not, as Fries asserts, a fungus proceeding to dissemination by rupture of the hymenium. The sporules are dispersed by rain or by alternations of dryness and moisture of the sacculus, and perhaps by a kind of endosmose.

Fée is disposed to believe that the medicinal activity of ergot resides in its entire mass, that is, in both *sphacelia* and *nosocarya*. The relative proportion of these two parts to each other are as one to thirty, and, therefore, the proportion of the sphacelia in a few grains of ergot is too small to lead us to suppose that it is exclusively the active principle.

The preceding is a brief abstract of M. Fée's opinions regarding the nature of ergot. We confess a careful perusal of his memoir has not made us converts to his views. We believe he has in several instances totally mistaken the nature of the organs the structure of which he has investigated. This we think is particularly the case with the part which he calls the fungus (*sphacelia*).

SEIZURE OF ILLICIT SPIRIT OF NITRE.

A regular system of fraud has for some time past been practised by certain makers of sweet spirit of nitre, who have been selling it at a price considerably below the cost of the ingredients from which it is prepared. Mr. Davis, one of the detective officers of the Excise, seized in July last above 1,000 gallons of spirits of wine at a complete and extensively fitted illegal distillery, in the Globe Road, Stepney; and, by documents there found, a clue was obtained to a large quantity of spirit which had been previously removed. He traced the spirit to various houses, and discovered that Bayley Brothers, of Globe Road, were identical with Berkeley and Co., of Holloway Road, who had been detected in similar practices last year. Subsequently he seized in the premises of Mr. Firmin, of Rupert Street, fifty-seven carboys, containing eighteen gallons each, of spirits of nitre, and thirty-six empty carboys, which he identified as having come from the same source. On the premises of Foot and Co., of Battersea, he found nineteen carboys; and at Price's, nine carboys. In the stable of a man named Smith, in the Maze, Tooley Street, he found, concealed in the straw, ten carboys, and two casks of molasses. At Gray's stables, St, John's Wood Road, he found ten carboys. At Mr. Hastle's, of Wapping, he also found twelve carboys. The total amount seized, exclusive of the duty, is valued at above £2,000.

It having been ascertained that some of the spirit had been sent to Birmingham, orders were sent to the officers in the district, who seized a quantity amounting to about 150 gallons.

ITINERANT QUACK DOCTORS.

A Correspondent at *Oldham* in confirmation of our statements respecting this genus, has sent us an account of three who infest his neighbourhood. John Barratt, formerly a woollen-draper, resides at Oldham, and has a large practice as a quack doctor. He visits Todmorden once a week, Manchester and Middleton once a week. He boasts of having more patients than any four surgeons, and calls himself "Jack at the last pinch," stating, that he is generally sent for when other doctors have given up the case as lost.—Joseph Sunderland lives at Oldham, and attends Rochdale market on Mondays, and Ashton Market on Saturdays. His stock consists chiefly of herbs, and he has a pill called "black pill" or "pill Joe," with which he does great execution.—Richard Marwood Jackson Pit, styles himself a curer of all sorts of ulcers, sore legs, tumours, swellings, burns, rheumatism, &c., by his wonderful black ointment, and puffs his salprunella balls as "The real China balls: "the blacks have to dive into the sea to get them off the rocks—a certain cure "for toothache, &c."

Mr. Duggard, of Hereford, has sent us a hand-bill of Dr. Greeves, who divides his favours between Hereford, Worcester, and Cheltenham, having a stall in the market of each place. He practises as a worm-destroyer, bleeds and draws teeth, and undertakes the cure of all disorders. He persuades his victims that it is absolutely necessary "to let blood every spring and fall."

Another Correspondent informs us, that at Stalybridge, near Manchester, there are several persons calling themselves Druggists, who have left the mills, and commenced business without any education or apprenticeship. It is these persons who take a prominent part in the sale of Godfrey's Cordial for Children. We have received a hand-bill of Dr. Eyres, of Stockport who commences by stating that "Certain itinerant persons are going about offering to vend spurious medicine for the destroying of worms, &c. Dr. Eyres respectfully cautions the inhabitants of Stockport against purchasing such TRASH," and then in strong terms recommends his own. He is to be consulted daily at Stockport, except on Tuesday, when he visits Macclesfield. He subjoins a list of thirty-eight disorders, which, as well as "all other diseases incident to the human frame," he undertakes to cure.

From the facts which we have already collected on this subject, it appears that the practice of these impostors is carried on to a fearful extent in most country towns.

TO CORRESPONDENTS.

Caution.—A Correspondent mentions another instance of a custom to which we have alluded on a former occasion, in pushing the sale of new proprietary medicines. The party interested inquires for the article, at several shops, and orders it to be procured, but does not call again. In this manner our Correspondent became the possessor of a bottle of Hill's Essence of Copaiba and Cubebs, which is left on his hands.

"Juvenis."—Alkalies throw down camphor from its solution in water, which will account for the white flocculent precipitate in the case alluded to. —(2.) Mineral or coal naphtha is one of the best solvents for Indian-rubber.

L. A. P. S.—See the above. Pyroxilic spirit will not answer the purpose.

"Chondrine."—(1.) It is probable that the nitric acid was not of the right strength, which would account for the whole of the silver not being dissolved in the process alluded to.—(2.) Pure sulphate of iron should be used in forming the antidote for prussic acid recommended by Messrs. Smith. —(3.) Chondrine.

B. B.—When elixir of vitriol is ordered in a prescription, acid sulph. aromat. of the Edinburgh Pharmacopœia should be used, which is very similar to the obsolete formula of P. L., 1745.

M. P. S. (Liverpool).—(1.) Essence of dill, cinnamon, &c., for medicine chests, may be made in the same manner as essence of peppermint, by mixing the essential oil with spirit. They will however occasion a turbidness on dilution with water.—(2.) We are not acquainted with the meaning of the term.

A. P. S.—The Pharmacopœia gives full instructions for testing hydrocyanic acid.

W. H. F. should apply to an analytical Chemist, enclosing a fee.

D. D. S.—(1.) Although the addition of pulvis acaciæ to the guaiacum mixture alluded to might make a more elegant compound, we cannot sanction any deviation from the instructions of medical men in such cases.—(2.) Oss according to the Pharmacopœia, means 10ozs. We are aware that some medical men have not adopted the imperial pint. In cases of doubt, application should be made to the prescriber.—(3.) We have already given as a formula for mistura salina, lemon juice saturated with carbonate of potash, and diluted with an equal quantity of water.

"Lux."—We cannot pretend to invent a theory respecting the modus operandi of light in causing decompositions and combinations.

J. W.—The effects alluded to on adding sulphuric acid to oil of bitter almonds, are well known and described in most chemical works.

"Inquisitor."—Hydrated peroxide of iron may be obtained by adding ammonia in excess to a solution of the chloride or any other per-salt of iron.

"Protos."—Essence of Vanilla is merely a strong tincture made with rectified spirit.

A.P.S. (Ryde).—The crystals are hydrated sulphate of lime, and probably arise from the oxidation of sulphurets.

E. W.—We cannot give a recipe for acidulated drops.

J. F.—Nitrate of silver, nitric acid, acetic acid, chromic acid, caustic potash, and other caustics are often used for removing warts. Sal ammoniac rubbed on the wart twice a day, is a very safe remedy.

Mr. Hall, Mr. C. S. D. Steward, and *ZZZZ* give the following formula for writing on zinc labels in answer to C. J. of Birkenhead:—Verdigris ʒj, Hydrochlorate of ammonia ʒj, Lamp Black ʒss, Water ʒx. M.

Z.—(1.) We cannot recommend a remedy for a red face.—(2.) See the notice inside the cover.

"Amator Scienciæ."—The powder sold under the name of salt of lemons, for taking out ink stains, is made with equal parts of cream of tartar and salt of sorrel.—Scouring drops, vol. iv, p. 340—Bandoline, vol. iii. page 94.

"Tyro."—We have frequently had occasion to allude to the subject of late hours, and regret the difficulty which exists in effecting a reformation. At the same time, our opinion remains unaltered that this difficulty cannot be surmounted by the means proposed. The case of the Drapers is not in all respects parallel with that of the Chemists. It would be more easy to induce the public to purchase clothing within reasonable hours, than to prevail upon patients to be ill at such times only as may suit the convenience of the Chemists.

Mr. W. King and Mr. Lathbury, of Liverpool, and Mr. Barkley, of Little Tower Street, London, recommend in strong terms the membrane capsules, described, page 257, as being superior in efficacy to those in common use, and much less disagreeable.

"Scotia," alluding to the effect of essential oils, kreosote, &c., on oxide of silver, mentions the fact that a mass made with this substance and conserve of roses frequently undergoes spontaneous combustion; but that this does not take place when liquorice powder and mucilage are used as the vehicle. [We have observed the circumstance alluded to, and have known a box of pills to ignite spontaneously to the astonishment of the patient.]

T. T. (Bedale) inquires (1.) Whether a female can take an apprentice? and if a young man bound to a female can be admitted as an Associate? [Yes.]—(2.) No person can be admitted as an Associate without passing the examination; see Vol. ii, No. 8.—(3.) The dose of liq. opii sed. is the same as that of laudanum.

G. H. S. *The Pharmacopœia Universalis*, an English translation of which has been published by Dr. Rennie, answers to the description given.

W. G. K., A.P.S.—We are not acquainted with any such work.

"Novus Socius," and X. L. Z.—*Fownes's Manual*, or *Graham's Elements of Chemistry*; *Pereira's Elements of Materia Medica*, or *Thomson's* or *Christison's Dispensatory*; *Phillips's Translation of the Pharmacopœia*; *Lindley's Elements of Botany*, *Selecta è Prescriptis*.

M.P.S. (Oxford Street).—We understand the new edition of *Gray's Supplement* is, in great part, printed, and will soon be ready for publication. It has been entirely rewritten and much enlarged.

"Egomet."—A translation into English of Rose's work on *Chemical Analysis*, somewhat abridged, was published some years ago by Mr. Griffin, of Glasgow. It is now out of print, but may be occasionally met with at the second-hand book-stalls There is a French edition of the work at large.

"Juvenis."—(1.) Yes.—(2.) See the answer to "Novus Socius" above.

Advertisements to Mr. Churchill, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. Smith, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to The Editor, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. VII.—JANUARY 1st, 1846.

ON THE COMPILATION OF A NATIONAL PHARMACOPŒIA.

> "Attamen paulum progressis, nova difficultas orta est; siquidem Pharmacopœiam, non, ut ante, Londinensem, verùm Britannicam conficere voluimus, quæ scilicet Scotiam, Hiberniamque, cum Angliâ simul complecteretur. Hinc gentis utriusque Academias in consilium vocare necesse fuit; quod cum ex locis tam longuiquis vix, aut ne vix, fieri posset, tandem negotio incepto desistere coacti sumus."*—*Pharmacopœia Londinensis.*

We believe the above is the only instance in which an attempt has been officially made to unite the three Pharmacopœias into one; although private correspondence has at various times been commenced with this object. The distance between the three capitals was the assigned cause of the failure of the attempt; but there is reason to believe that other obstacles existed. We have been told that the Dublin College, having, at the time the proposition was first made, recently printed a large edition of their Pharmacopœia, was unwilling either to indemnify the publisher, or to inflict upon him the injury which he would have sustained by the sacrifice of his stock on hand in the event of the work being superseded. The Edinburgh College evinced a disposition to amalgamate, and a deputation came to London to confer with the Pharmacopœia committee then in operation. At one time hopes were entertained that this negociation would have been successful, but it was found so difficult to consolidate the various opinions, and reconcile the local prejudices in favour of accustomed formulæ, that the attempt was ultimately abandoned as fruitless.

The distance between London and Edinburgh no doubt materially increased the difficulty of performing the task; but we must not forget that at that time the journey was one of from two to three days, whereas, with the modern facilities of railway travelling, it may now be accomplished between breakfast and dinner. This circumstance not only removes the ostensible obstacle to the desired arrangement, but materially increases the necessity for its speedy attainment. A century or two ago so little intercourse existed between the two capitals, and the journey was considered so formidable, that it was usual for those who undertook the adventure to make their wills and take leave of their friends before leaving home. Any discrepancy then existing between the London and the Edinburgh Pharmacopœias was unimportant, as the prescriptions of each were chiefly confined to their respective localities. Under existing circumstances prescriptions as well as patients fly about the country with such rapidity, that great danger and inconvenience result from the ambiguity prevailing in the formulæ of the two colleges. This has been forcibly pointed out by Mr. Squire, and the subject cannot be too strongly urged upon the attention of those who are responsible for the result. That an amalgamation of the three Pharmacopœias must, at no very distant period, take place, cannot be doubted. How soon this can or ought to be effected, is the only question on which a difference of opinion can exist.

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* However, but little progress had been made when a fresh difficulty arose: as we were desirous of compiling, not as before, a London Pharmacopœia, but one which should include Scotland and Ireland with England, it was requisite to consult with the fellows of both colleges; and as on account of the great distance, this was with difficulty accomplished, we were at length compelled to abandon the negociation which had been commenced.—*Phillips's Translation.*

It is generally supposed, and, we believe, on good grounds, that the forthcoming London Pharmacopœia is in a very forward state, and will be ready for publication in a few months. If this information be correct, we fear the National Pharmacopœia will not be called into existence so soon as we could desire. At all events, much benefit may arise from the discussion of the subject in the profession, which will prepare the minds of medical men in the three capitals for the kind of changes which would be involved in the undertaking.

In the introduction of any alterations either in the nomenclature, or in the formulæ of a Pharmacopœia, there are a few general rules which ought to be most scrupulously observed.

First, No term which is in use in an existing Pharmacopœia should be adopted in a new edition, with a signification different from that which already belongs to it.

Second, Corresponding preparations in the Pharmacopœias of the three nations, if differing in strength or composition, should have distinctive names.

Third, Whenever any material alteration is made in the strength of a preparation, a fresh name should be given to it.

Fourth, Whenever the introduction of modern chemical nomenclature would create ambiguity or mystification, it should be avoided.

Fifth, The names adopted should be such as are not likely to be mistaken for each other when written in prescriptions with the usual contractions,

It is to be regretted that in former Pharmacopœias these rules have not been sufficiently observed, and we can testify from daily experience, that this oversight has occasioned very great inconvenience and perplexity to dispensing Chemists, as well as danger to patients. The kind of defects alluded to, are more likely to be observed and guarded against by the Chemist than by medical men, for the same reason that those who wear a tight shoe are better able to state where it pinches, than the maker of the shoe.

In considering the division of labour in the medical profession, we cannot fail to observe some degree of inconsistency in reference to the manner in which the Pharmacopœia has hitherto been compiled. It is the particular duty of the physician to attend at the bedside of the sick, and to study the effects and properties of remedies in the relief of disease. It is the especial duty of the Pharmaceutical Chemist to mix and prepare those remedies, to produce for the use of the physician such compounds as he may require to prescribe, or to suggest improved processes and combinations, the result of practical experience in the laboratory. Thus the members of each of the two classes, by devoting their talent and industry to their particular pursuit, mutually assist each other.

But in the compilation of the Pharmacopœia the Chemist takes no part. The physician, passing the boundary of his own province, betakes himself to the laboratory, and systematically undertakes a series of chemical and pharmaceutical experiments in the manipulation of the several preparations of the Pharmacopœia, and in comparing the results of proposed new processes. When the task is done, and a most arduous one it must undoubtedly be, especially to those who are not accustomed to laboratory manipulation, the new Pharmacopœia is handed to the Chemist, who is bound by law implicitly to conform to its injunctions.

To the Chemist, a new Pharmacopœia is a very serious and weighty matter. He is expected, immediately on its appearance, to be acquainted with all its contents—to be able to point out any alterations which may have been made in it, and to add to his stock every new compound or preparation which has been introduced. But to medical practitioners it is an affair of secondary importance. It is not to be supposed that patients are to be neglected while the doctor is studying the fresh edition of the Pharmacopœia, and learning all the new names. Months or even years may elapse before a medical man has found leisure to make himself acquainted with the modern phraseology and pharmacy of the College. He continues to prescribe, and to relieve his patients as before, and unless a new remedy is suggested to him in any particular case, he orders those with which he is already acquainted. He orders nitric acid, acetic acid, hydrocyanic acid, carbonate of soda or potash, &c., &c., not being aware that in these and many other cases, the terms denote preparations differing widely in strength or composition from what he intends to prescribe. When his attention is called to the fact by a Chemist who is in doubt as to his meaning, he replies that, his time being entirely occupied with his practice, he has not had leisure to go to school again to learn modern Chemistry, and not requiring the new remedies, he continues to prescribe according to the Pharmacopœia to which he has been accustomed for many years.

Thus, while the Chemist, who takes no part in the compilation of the Pharmacopœia, is bound by law to obey it implicitly, the physician, who belongs to the body from which the work emanates, may use his own discretion on the subject, and may continue to adopt the old nomenclature and formulæ as long as he pleases, notwithstanding the doubt and perplexity which are thus inflicted on those who dispense his prescriptions. If the rules above laid down were observed in the construction of the Pharmacopœia, no inconvenience would result from this circumstance; practitioners of the old school might continue to prescribe their favourite remedies, and every fresh or altered preparation being designated by a new name, no ambiguity could exist in the adoption of modern phraseology.

We are aware that the Apothecaries' Hall has been resorted to by the Pharmacopœia Committee of the College of Physicians on various occasions, and that hints and suggestions have at all times been courteously and gladly received by that Committee; yet it has always been the case that the College of Physicians, a body which renounces altogether the practice of Pharmacy, is solely responsible for the production of a work containing practical instructions in Pharmaceutical manipulation for the guidance of Pharmaceutical Chemists.

The Chemists, not having as yet become a legally educated body, could not expect to be officially consulted as they might have been if they had enjoyed their proper position in their department; but having now taken the place formerly occupied by the Apothecaries, and being generally recognised as the representatives of Pharmacy, they may, without undue presumption, look forward to the time when their practical experience in the daily manipulations of the shop and the laboratory will become available in the compilation of a National Pharmacopœia.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

LECTURE ON THE CHEMISTRY OF ANCIENT AND MODERN TIMES.

BY GEORGE FOWNES, F.R.S.,
Professor of Practical Chemistry in University College, London;
Professor of Chemistry to the Pharmaceutical Society.

THE object I have in view this evening, is to give you some idea of chemical science at different epochs of its history, and to trace if possible the spirit in which it was pursued, and the objects sought at different periods; to contrast, in short, the state of Chemistry in ancient and in modern times.

We shall find that these objects have become entirely changed with the lapse of time; the chemistry of antiquity is a very different thing from the chemistry of to-day. The history of chemical arts and manufactures goes back to the remotest periods of human history,—the science of chemistry proper, the art of investigating nature, is not a century old. The great vital principle of the atmosphere, the chief constituent of water, the body which forms more than a half of the whole earth and ocean, was for the first time separated and described in 1774.

It is easy to understand that among a people like that of Egypt in ancient times, or of China at the present day;—I was going to say of England, where the territory, although fertile enough, is limited in extent, and where the means of subsistence for vast multitudes of men have to be sought in the preparation of objects of utility and luxury for a foreign and domestic trade, the useful arts which lead directly to the end in view, that is, immediate wealth and prosperity, should be more valued than the discovery of apparently barren general principles; but it is not so easy to understand that this magnificent field of investigation should have been neglected and overlooked among such an acute and enlightened nation as that of the Greeks. The only explanation that can be given, is, that the genius of this people led them rather to the search for speculative truth in the shape of mathematical and metaphysical inquiry, than to the simple study of nature by the appointed way of experiment.

There is not the least evidence to show that the working and manufacturing nations of ancient times, the Egyptians and old Hindoos, possessed anything which can be termed a systematic body of chemical science; the facts they knew were many and most valuable, but they were not understood, or misunderstood, and the link to connect them was wanting: they had no rational theory of the reactions and changes they could not fail to witness.

I am sure I need hardly remind you of the perfection, notwithstanding, to which many of the arts had been brought among the ancient inhabitants of Egypt; their singular fashion of embalming the dead, and with them depositing in the tombs the implements they had used in life, and, besides, of decorating the walls of the tombs themselves with paintings of actual processes in the arts, in agriculture, in navigation, and representations of their habits and customs in public and domestic life, have made known to us much of their intimate history; the works of Sir Gardner Wilkinson and others who have visited and described the sepulchres of Thebes, are full of the most interesting details thus acquired. But the papyri which have been unrolled, and the numerous inscriptions on monuments and obelisks which have been deciphered, give no hint whatever of a philosophy of chemistry; and in later times the so-called "sacred art" of the Egyptian priests, which it was death to reveal, appears to have been little more than the beginning of the attempt to transmute the metals.

So early as the time of the Exodus, the skill and dexterity of the Egyptian artificers was proverbial; the Hebrews carried with them to Palestine the arts of Egypt; the Greeks got their earliest civilization from the same source. These people were thoroughly acquainted with the working of metals; they must have had steel, or they could never have executed their gigantic sphynxes and obelisks, although no steel tools have yet been found; they made bronze with copper, the produce of Egypt, and tin from India, and perhaps from Cornwall, with this their ordinary tools and weapons were made, besides numerous other articles employed in common life, among the rest, specula or mirrors of polished metal, which have been found in the tombs, and to which a curious allusion is made in the book of Exodus (xxxviii. 8.), "And he (Bezaleel, the worker in metal) made the laver (or cistern) of brass, and the foot of it of brass out of the looking-glasses of the women who assembled at the door of the tabernacle of the congregation."

The Egyptians were skilful glass-makers, they used it for ornaments and vessels of all kinds, often stained with beautiful colours, and applied to all purposes except that of windows which are there unnecessary. They manufactured excellent pottery, they spun and wove linen and cotton, they understood the art of dyeing even with indigo, they were not behindhand in the means of conviviality, for they made renowned wines, and were besides great brewers. On the sea they were at home, they built ships of burden, and actually, it is said, circumnavigated

Africa, passing from the Persian Gulf round and home by the straits of Gibraltar more than two thousand years before Vasco di Gama of Portugal doubled the Cape of Good Hope from the westward.

But although the Egyptians no doubt invented and improved much, there is reason to think India should be looked upon as the birthplace of the arts of civilization. If the Hindoo literature is to be trusted, these people have been from the most remote antiquity in possession of manufactures and processes involving that particular kind of chemical skill which I have already referred to, and the same remarks apply in great measure to the Chinese, who have for ages possessed arts which in Europe are comparatively modern—gunpowder, the mariner's compass, dyeing, porcelain-making are all examples.

To my mind, the state of the Chinese is one typical of the particular phasis in the history of the human race, in which science or its substitute assumes this utilitarian character; I think the modern Chinese by no means bad representatives of the ancient Egyptians. Their civilization is of a stationary kind, it grows to a certain point and then stops, the growth of thought is stunted in dimensions, and moulded like the feet of the women into conventional forms; the opinions and usages of antiquity are held in blind and indiscriminating reverence, while speculative innovations, alike good and bad, are treated with contempt or fear. The Chinese are, in great measure, from some of these very circumstances, unrivalled in many of the chemical manufactures; their pigments and dyes and porcelain are often far better than ours; but for all this they have no science of chemistry.

But we need not go so far as China to learn how little dependent on the whole the arts have been upon scientific induction; processes have sprung up, and still spring up, which we cannot even explain; mere accident, a kind of hap-hazard experimenting without a definite object, and without the guide of a principle, have led to these results. It is easy to find examples—as the famous Turkey-red dye on cotton, the daguerreotype and kalotype, silvering mirrors by new process of depositing metallic silver, &c.

In saying this, I do not depreciate the value and importance of the many happy and beautiful applications of scientific chemistry to the arts which have lately been made; still I think it is evident that the general function of science has been rather to improve than to create.

Now we leave these practical men, ancient and modern, to proceed to a sketch of the circumstances under which the foundations of our knowledge of the properties of bodies, the groundwork of the future science of chemistry, were laid.

It is extremely difficult to trace the first beginnings of those extraordinary transmutation doctrines which make up the chemistry of the middle ages; how much soever these doctrines may now excite our laughter or our pity, it is incontestably true that in the discussions raised concerning them, and the experiments instituted in search of evidence for their support, the germs of that which constitutes the science of our own days were developed, and developed often to a very considerable extent. The objects sought are no longer the same, but the methods of inquiry which they pursued, and the instruments and means of research which their unbounded patience and ingenuity contrived, yet remain to us, and form the groundwork of our own methods of investigation.

It appears that the word *Chemia* or *Chemu* is first met with in the few remains of the literature of the third and fourth centuries; it is described to be the preparation of gold and silver. This is in fact what was afterwards termed alchemy, the prefix *al* is only the Arabic article. At this period, when the old worn-out philosophy of heathenism was just becoming supplanted by Christianity, corrupt and dogmatic enough it may be, the priest-nobles of Roman Egypt cultivated certain secret arts, termed *holy* or *sacred*, among which, that of making the precious metals from base and common materials occupied a conspicuous place. The temples were the laboratories of these experimentalists; their discoveries, real or supposed, were carefully hidden from the vulgar without the sacred pale, and invested with all the awe and majesty of religion itself. To reveal them was death, the punishment of the peach-tree, as it is termed, which M. Hoefer conjectures to have been nothing less than a fatal dose of hydrocyanic acid, prepared by distillation from the leaves of some member of that family of plants. From these very circumstances, we can do little more than conjecture the precise objects which these people proposed to themselves;—probably to maintain and increase their own power and dignity, and to perpetuate their rule over their less enlightened countrymen. Magic and necromancy, and that most ancient of delusions, astrology, were also diligently cultivated and mixed up in a strange manner with their chemical studies; the universe was peopled with imaginary beings, agents of good and evil, to propitiate or command whom was a necessary preliminary to success in the great work.

When the dominion of Egypt passed into the hands of the Mohammedan Arabs, the intellectual as well as the tangible wealth of the country became the property of the conquerors, and the change of masters was a very beneficial one for the progress of science. The idle and superstitious and often impious and revolting practices which before obtained, and which were quite incompatible with the severe simplicity of Islamism, the fundamental principle of which is a cheerful and unqualified submission in all things to the will of the one Supreme Being, were in great measure condemned and laid aside; the exertions of the Arab sages took a new and most useful direction, that, namely, towards medicine and pharmacy. It is not surprising that the success they met with in this glorious pursuit of remedies to alleviate some of the worst of the evils which afflict mankind, should have excited their ardent imagination to seek for a panacea for all sickness, an universal medicine, an elixir of life, the search for which became henceforth co-extensive with that for the philosopher's stone, or powder of projection, by the aid of which the baser metals were to be transformed into gold and silver. From various motives, however, they retained much of the mystery and concealment of their predecessors; they invented a nomenclature and language of their own; their talk was of black dragons and green lions, by whose birth, voracity, death, and reproduction, were symbolized the various reactions which they witnessed in the preparation of the many metallic and other compounds known to them.

The name of Geber is familiar to all as that of the earliest Arabian alchymist, whose writings have come down to us; his real name was Abou Moussah Djafar, al Sofi; he flourished about the end of the eighth century. By way of a sample of the actual state of practical chemistry among the Arabs at this early period, I shall cite a few passages from his writings, which have been collected very diligently, and translated by M. Hoefer, to whose book I feel pleasure in referring those who feel curious in the history of chemical science. The precision of his language, the accuracy with which details are given are admirable—this man must indeed have been a shining light; his words are imbued with the true spirit of philosophy; he even went so far as to deny the possibility of transmutation, although on other grounds than those we should now adopt.

He gives such advice as this to those commencing the study of Chemistry, advice which we shall all do well to follow: "The student" he says, "must be sound in mind and in body, he who suffers himself to be led away by his imagination, his vanity, or his vices, is as incapable of success as if he were blind or mutilated. The greatest patience and sagacity are required. When a difficult experiment has been commenced which does not at first succeed, we must take courage to persevere and follow it to the end, never stopping half-way, for an imperfect and unfinished work, far from being useful, is hurtful to the progress of science;" and he goes on in the same strain to enforce the necessity of carefulness and moderation in all things. Concerning transmutation, he says, "It is as impossible to transmute the metals, as it is to change an ox into a goat, for if nature employs a thousand years to form the metals, how shall we pretend to do so, whose lives are so brief? It is true that the heat we employ may produce sometimes in a short period that for which nature requires years, but how slight is the advantage in this respect!"* What just view of the slow formation of mineral bodies in the earth by causes ever in action! How they put to shame the crudities of the fire-and-water geologists which prevailed not half a century ago! Djafar describes in plain terms the combination of spirits or gases with metals; the properties of the metals themselves he describes excellently well, namely those of arsenic, mercury, gold, silver, lead, tin, copper, and iron, besides sulphur; he gives the various modes and uses of sublimating, distilling, calcination, solution, crystallization, and host of proceedings. The mode of assaying gold and silver by the cupel, he gives in precise terms; also the preparation of caustic potash, sal-ammoniac, phosphate of soda, nitrate of silver, corrosive sublimate, red oxide of mercury, liver and milk of silver, mineral acids, &c., &c., by processes which deserve anything but contempt.

The idea that the metals were compound bodies is very ancient; according to Djafar, they consist of mercury and sulphur, with sometimes a third element, arsenic, from whose varying proportions and modes of combination the differences among them resulted. This mercury, sulphur, and arsenic however, were not the vulgar substances which now go by such names, but certain hypothetical principles *supposed* to exist, real elements of matter. Verily, in after times his countrymen and their imitators degenerated from the sober philosophy of their great leader, for we find them talking about the reproduction of metals by seed after the manner of plants, and other puerilities still more laughable.

We have a long list of the names and some of the writings of succeeding Arab chemists of more or less celebrity, most of whom directed their attention to medicine as well as to chemistry, and also those of other countries as France and Germany, with whom the Arabs, especially those of Spain, who were at the time by far the most enlightened and industrious people in Europe, maintained friendly relations. The Christians and Mohammedans of those days knew and respected each other, the schools of learning and philosophy of the Spanish Moors were frequented by students of all nations; the most courteous spirit reigned between the knights of Spain and their Moslem foes in the truces and intervals of actual war; they had been too often witnesses of each other's prowess in the field of battle, and the little less formidable tournament; it was reserved for the detestable bigotry and religious rancour of a later age, under the direction of one who should have been a minister of peace and goodwill, to persecute and expel from their fair territory this people who had striven so valiantly to maintain their fathers' conquests; in so doing, he laid a deep and sure foundation for the degradation, misery, and ruin which in after years overspread the Peninsula.

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* Histoire de la Chimie, par F. Hoefer, i., p. 312.

I have little to say concerning the numerous chemists and alchymists who flourished between the thirteenth and seventeenth centuries in France, Germany, and England. Among these occur the names of Albertus Magnus, Roger Bacon, Vincent of Beauvais, St. Thomas d'Arquin, Arnold of Villa Nova, Raymond Lulli, William of Paris, Sir George Ripley, Nicholas Flamel, Bernard of Trevise, Basil Valentine, Paracelsus, and many others of inferior note. Some of these were men of philosophical spirit and unwearied industry, many were ardent enthusiasts, wasting their means in the pursuit of an unreal vision, which continually fled before them; and, lastly, some there were who deserve no better name than that of quacks and impostors, who sought to enrich themselves by the greedy credulity of others. During this period, however, discoveries were made,—two new metals came to light, antimony and zinc; the list of saline compounds was vastly increased, and better processes for their preparation were devised; alcohol was eliminated, ether in an impure state, and several other important organic substances. Among so many labourers, some work must needs be done, but it was all work of detail. No discovery of general principles took place; received ideas, stamped with the authority of antiquity concerning the compound nature of the metals, paralyzed the feeble and imperfect attempts at analytical investigation which were made. It must be remembered that the most indefinite notions prevailed concerning gaseous bodies, or as they were then called "spirits;" that the composition of water and of the atmosphere was unknown, and fire itself, for ages the mysterious object of regards approaching the character of worship, one of the elements.

The fascination exercised in those days by the dreams of alchymy, may be judged of in some measure by the fact, that even in modern times, with the weight of evidence of the whole science on the other side, and without the support of a single unexceptionable experiment, of one fact worthy of the name, believers in transmutation have existed. It is painful to hear of treatises written in these days to prove the convertibility of carbon into silicon, and iron into rhodium, or the generation of carbon in the system of living plants, and of lime and phosphorus in the bodies of animals. We even now and then see advertisements in the public prints offering to teach the hermetic art[*] for a consideration. These things should teach us to look with admiration on the industry and perseverance of our predecessors, and with pity on their wanderings in the barren and waterless desert of baseless speculation, without the infallible guide, the chart and compass of our own days, the art of quantitative analysis.

About the middle of the seventeenth century, things began to improve apace, a succession of distinguished men arose, who cultivated the science for its own sake, and without undervaluing its obvious applications to medicine and the arts, began to cast about for the means of solving the great fundamental problems of the composition of the air, the nature of fire, and others of the kind. Transmutation was dying a natural death; ages of unsuccessful labour were beginning to show their effects; the hope of attaining the supreme good, the talisman of all happiness, honour, and prosperity, by distilling putrid urine in a retort, gradually vanished, and men even began to doubt the received opinions of old, of the possibility of such things. The long sleep of the middle ages had been broken; the invention of printing had begun widely to scatter the means of instruction; bold, wicked, troublesome men came, who scoffed at antiquity, denied the divine inspiration of Aristotle, and dared an open and unblushing appeal to the Majesty of Nature, as the one only appointed mode of eliciting truth—and Nature answered them.

Many of the early members of the Royal Society of London, and of the Academy of Sciences at Paris, both of which were founded at about the same period, viz., 1662, contributed largely to the extension of chemical knowledge, and from this time systems of chemistry began to appear, facts were recorded in a more careful and philosophical spirit, and individual substances were better described; in fact, what we may term mere practical chemistry made rapid progress, and materials were accumulated which a few years afterwards furnished to Lavoisier and his colleagues the means of laying broad and deep the foundations of our present science. Among the illustrious names of this period may be mentioned those of Hooke, Mayow, Boyle, and Newton in England; Le Fèvre and Lemery in Paris; Van Helmont and Boerhaave in the Netherlands; Beccher and Stahl in Germany, and many others.

To Stahl the merit is attributed of directing the attention of chemists to the search for elementary substances; elementary in the modern acceptation of the term, that is, not yet decomposed; his name, however, is better known in connexion with a once renowned theory of combustion, and the relation borne by metals to their calces (oxides). The words *phlogiston* and *phlogistic*, although formally banished from chemical science, are yet sometimes heard. This phlogiston was supposed to be an essential constituent of combustible bodies; the separation or disengagement of phlogiston constituted the act of burning; metals contained it; when lead or tin were oxidized by heat and air, the phlogiston was supposed to be expelled, and when the oxides were again reduced by charcoal-powder at a high temperature, the metal re-acquired its accustomed dose of phlogiston at the expense of the charcoal. It serves to show that the dignity of experimental facts, the finality of an appeal to Nature had not then been fully recognised, for men were not ignorant that the weight of the calx always exceeded that of the metal from which it had been produced; the observation had been made centuries before, but so firm was the hold of preconceived opinions upon the mind of even such a man as Stahl, that it was judged better to have recourse to the ridiculous idea of ascribing to the phlogiston a positive levity, a power of diminishing weight by the addition of matter, than to accept the plain and obvious interpretation of the experiment, that the calx were the compound and the metal the simple substance. Let us take warning.

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[*] *Athenæum*, Nov. 12 and 19, 1842.

We now reach the third and last period of our history; we have traced the science from its birth among the practical arts and manufactures of thickly-peopled nations from whose necessities and straitened means of subsistence these latter arose; we have watched its wanderings amid the errors of speculation and fancy, and we now reach the advent of those brilliant discoveries in pneumatic chemistry which completely remodelled the then existing science, and prepared a comparatively smooth and level way for its future career.

On the first of August, 1774, Dr. Priestley made the discovery of a permanently elastic fluid, different from common air, disengaged by heat from the *red precipitate* of pharmacy; with great ingenuity, he contrived means of collecting, preserving, and examining this substance; he observed its extraordinary power of supporting combustion and of maintaining animal life, and others of the more salient properties of this remarkable body; in accordance with Stahl's combustion-theory which he adopted, he gave to it the name of "dephlogisticated air." The term "oxygen," you know, is of later date, and was conferred upon it afterwards at the time of the reformation of the chemical nomenclature. Although by very far first in importance, oxygen was not the first of the gases in order of date; inflammable air (hydrogen) had long been known. Dr. Black's "fixed air," to the discovery of which his admirable researches on magnesia and lime led him, had almost ceased to be a novelty; nitric oxide, and even hydrochloric acid gas were discovered by Priestley himself one or two years before the period referred to. The discovery of oxygen, however, was the key to the problem of the nature of the atmosphere and the composition of water;—great fundamental facts, the importance of which it is impossible to exaggerate, for they contain within themselves the living germs of the whole science of philosophical chemistry.

The discovery of the composition of water is attributed to Mr. Cavendish, who showed that when hydrogen was burned in dry air water was produced. A claim on the part of the celebrated James Watt has recently been put forward. We do not know with certainty to which of these illustrious men our thanks are due for so great a boon.

Among the brightest names which adorn the annals of chemical science, will ever be placed that of Lavoisier, who at this period pursued his researches in France. To call Lavoisier the Newton of Chemistry would scarcely be a profanation of that honoured name. The new facts he actually discovered were not remarkable; it was his surpassing power of generalization, his acuteness in distinguishing between the essential and the accidental phenomena he witnessed in his careful and happy repetitions of the experiments of others, which distinguished him above all who went before. To point out the elementary nature of the metals, and show the fallacy of the evidence upon which the opposite view was founded; to explain clearly the nature of the metallic oxides and the composition of salts, were indeed great works; the reform of the nomenclature was chiefly the work of Lavoisier; and this nomenclature, after the lapse of more than half a century, is still adequate to the wants of the science, because its principle is sound and philosophical, and capable of indefinite expansion. To complete the catalogue of the obligations we owe to this great man, it may be said that he created the art of quantitative research; an appeal to the balance was Lavoisier's habitual argument; it was his infallible guide, his just and most faithful judge. The fearful political corruptions which prevailed in the time of Louis XVI. permitted the existence of an order of men who farmed, as it was termed, the public taxes, on condition of paying a fixed sum to the coffers of the state. Most unfortunately to this body Lavoisier belonged, and although his private character was unstained, and his life free from the avarice and cruelty exhibited by many of his brethren, so obnoxious had this class of men become, that when the whirlwind of the revolution came, and the vengeance of the populace afterwards fell upon them, neither his private worth nor his illustrious deeds could save him; his name was in the fatal list, *Fermier-Général, No. 5;* the Revolutionary Tribunal condemned him to death, and he was executed on the 8th of May, 1794.

It is to be regretted that no collective edition of Lavoisier's writings has yet been published. M. Dumas has, however, promised us one. His best-known work is the "*Elémens de Chimie.*" I cannot help noticing a remarkable anticipation of Davy's great discovery of the metals of the earths and alkalis which is there met with, viz., that such bodies as lime, baryta, and magnesia, considered simple bodies, might possibly be compounds containing oxygen. The study of metallic salts had shown Lavoisier that these compounds were invariably formed by the union of an acid with the oxide of a metal, and not directly with a metal, as once supposed. Oxidation always preceded solution when a metal was acted upon by an acid—the oxygen being as it were the connecting link between the metal and acid. Now, the analogy between earthy and metallic salts was so complete, that the known composition of the one might be fairly attributed to the other.

It is not necessary that I should detain you with lengthened details of the history of chemical discovery subsequent to the time of Lavoisier; suffice it to say, that many of the difficulties and errors which had so long proved formidable sources of embarrassment, were got rid of; the means of experimental research were greatly improved; and, above all, the efforts and energies of enquirers, instead of being wasted in the vain pursuit of shadows, were steadily directed to the legitimate objects of science, the discovery of general laws. Henceforth a philosophy of chemistry existed, a body of science based on sound experimental evidence—principles arrived at by sure induction from numerous and harmonizing facts; not complete in itself although true and stable as far as it went, but capable, like its nomenclature, of meeting the exigencies of future discovery by its powers of indefinite extension.

The discovery of the great laws of chemical combination to which matter is subject, may perhaps be traced back to Wenzel's curious observations on the mutual decomposition of salts when mixed together in solution; the neutrality of the resulting new compounds when the salts employed were themselves neutral. These observations, which were published in the year 1777, were afterwards repeated and greatly extended by Richter, in 1792. The largest share of the honour of having established the existence of these most important generalizations, and also of having furnished very much of the mass of experimental data required, may be claimed by Berzelius, the great patriarch of analytical chemistry. The tables of *equivalents*, or combining quantities of matter by weight, which we now possess, are chiefly the result of the labours of this great chemist, and the very corrections of some of his first results which have become necessary by the introduction of more exact methods of experimenting, serve to exalt our admiration of his talents and industry; and, lastly, the discovery by Gay-Lussac of the simple and beautiful law of combination by volume among gaseous bodies, the consequence of a most strange and extraordinary relation between their densities and combining quantities by weight, completed this portion of the philosophy of Chemistry which may be safely said to exhibit relations and adjustments of the properties of matter as varied and as beautiful as those exhibited by the laws of physical equilibrium and motion.

It has always been my practice to set before you in the clearest, most distinct, and most emphatic manner that I could devise the fact of the truth and certainty of these great natural laws, and their independence of all theoretical or hypothetical considerations whatever. The laws are the generalized expression of pure fact—the results of an appeal made to the balance. Our views of the structure of matter,—of the ultimate cause of the different chemical and physical properties of bodies, and of the nature of combination, may be, and are, perpetually changing;—the laws of combination of which I speak are as immutable as those of force and motion. The atomic theory of Dr. Dalton has rendered great services to science. Dr. Dalton himself had a very considerable share in furnishing data for the the doctrine of equivalents. Without this famous theory, and the discussions to which it gave rise, it is more than possible that the very important recent discoveries which connect chemical constitution with external crystalline form, might be yet to be made; but for all this it may be as groundless as the theory of phlogiston. We must beware lest the common substitution of the word *atom* in chemical writings in place of *equivalent*, should lead us to suppose that we know anything about the constitution of matter, of which we are really as ignorant as the old philosophers of Greece, who discussed among themselves the interminable question of finite and infinite divisibility. Where there are no facts, and no hope of acquiring any, there can be no knowledge, and a lapse of three or four thousand years spent in speculation and guesses leaves us as we were.

The discovery of the chemical agency of electricity opened a vast field of research of the highest interest and utility in many points of view; the decomposition of water; the elimination of a new and most remarkable class of metals; the subsequent discovery of constant numerical relations between electricity and chemical forces in and out of the battery, are well fitted to excite our admiration and wonder. And then the applications which have been made of the principles brought to light,—the vast improvements in economy and efficiency in the instruments themselves; the thousand beautiful applications of processes depending on this mysterious power made and still making in the arts, scarcely less astonish and delight us. This branch of science seems to have been almost made our national property. Since the first discovery of the pile by Volta, research and applications have almost exclusively been the work of Englishmen;—we must not mention names of course, when many of the parties are still living; and it may be some consolation to us to be able to make, as it were, a set off of this acknowledged fact against the melancholy truth that in a course of experimental discovery, glorious and rich beyond all precedent, abounding in the strangest and most extraordinary truths, fascinatingly beautiful in its processes and details, and promising in its application to renew and remodel some of the most vital arts of life;—Englishmen have had hitherto little, very little, share.

It is now thirty-four years since MM. Gay-Lussac and Thénard laid the foundation of organic chemistry, by contriving a method of ultimate analysis of vegetable and animal substances, by the aid of which the proportions of carbon, hydrogen, oxygen, and nitrogen, of which they are composed, could be determined with some approach to accuracy. In researches which depend on analytical investigation alone, where the bodies seldom or never permit of synthetical production at will, it is obvious that this determination must constitute the one only key and guide to the whole science. By successive improvements, analytical processes adapted to all commonly-occurring cases, have been brought to a degree of perfection which leaves nothing to desire. The instruments have been most effective, and the labourers have been many, and in the short space of less than one generation a body of science has arisen, a mass of knowledge has been accumulated, of which it would be impossible to give you an outline, however rude and indistinct, without trespassing very far beyond my permitted limits. I need hardly remind you that in the summer we shall devote not less than five-and-twenty lectures to the study of some of the most prominent groups of objects comprehended in the vast domain of organic chemistry. We shall lump them together and take them in classes, and be compelled to adopt all manner of means for condensing into small space matter which might occupy us for a twelvemonth. And the pace at which organic investigation is now travelling is something prodigious;—books become antiquated by the time the ink of the last sheet is dry;—information is to be had only in the pages of bulky journals, which accumulate on one's hands faster than they can be read. Oh! let us hope that the time is come when the reproach shall be taken away! Let us hope that English chemists may henceforth bear their share of the glory and honour of this warfare against physical ignorance and evil! The field is open to all; opportunities never before enjoyed in this country are at the command of the youth of the present day. The means of instruction are ample, it remains to be seen whether those for whose benefit they are designed will avail themselves of so great a boon.

I think I have said enough to convey to you my idea of the manner and spirit in which the chemical investigation of Nature should be attempted; we must imitate, but with better light, the good old alchymists who prepared themselves for their great work of transmutation by self-denial, fasting, and prayer;—our spirit must be one of faith as well as of patient sober inquiry; we must approach the awful majesty of Nature with unbounded reliance on the uniformity and constancy of her everlasting laws, but with almost equally unbounded distrust in our own powers of arriving by induction at a knowledge of those laws. We must watch for exceptions and anomalies to our apparently general rules; if the rule does not fairly explain such, we may rest assured that our law is but a partial one, an approximation to the truth, but not the truth itself, and we must search further. Not a new fact or observation, however minute; not a change of colour in a glass of liquid; not a spicula of crystallization in a test-tube or a capsule must be allowed to pass unheeded and unrecorded, if an immediate and satisfactory solution cannot be found. The most insignificant appearances to a careless eye may furnish hints and indications, which, followed up in the patient, humble, all-observing spirit I am endeavouring to depict, may lead to brilliant and unexpected discoveries.

We should labour to cultivate habits of precision and accuracy in our experiments; all our results, even when on the minutest scale, should be distinct and unequivocal; *we should be quite sure of our fact.* Old Abou Djafar was right in saying that a bad experiment is worth less than nothing: it is a positive evil, a step backwards. All the errors and absurdities which have perplexed science so many centuries;—all the strange tales of our own days about the generation of elementary substances, and their transformation the one into the other, have arisen from vicious experiments. Science is full of false facts—negative knowledge; and the hardest labour the philosopher has to undergo is the rooting up and destroying these weeds, and the clearing of the ground for a better produce. The case is bad enough with Chemistry, but it is infinitely worse in sciences, as in physiology, in which the evidence is necessarily of a less direct and simple nature. We must be ever on our guard.

Whatever may be the difficulties of the task before us—and difficulties great and many there are—we may rest assured in the reflection that our reward is certain. No man ever followed the study of Nature with honesty and diligence without an ample repayment of discovery. The particular object sought may not at that moment be attained; none can tell at the outset of an investigation where it may lead, or in what it may terminate; but this is certain, that lead where it may and terminate where it may, new and important and interesting truths will have been met with, and the boundaries of human knowledge permanently enlarged. Disappointment in the study of Nature is impossible, provided legitimate objects be alone pursued, and by the appointed means. When physical truth ceases to be admired and loved for its own beauty and excellence, and scientific discovery becomes merely valued as a source of personal reputation, as the road to wealth and power and earthly dignity, then indeed may the bitterness of disappointment be often felt, and jealousy and bickerings divide those who beyond all men living should be the first to set an example of unity and brotherhood, whose lives are habitually passed in the contemplation of the handwriting of God!

PHARMACEUTICAL MEETING,

DECEMBER 10, 1845.

MR. INCE IN THE CHAIR.

A paper was read,

ON THE TEMPERATURE OF THE WATER USED IN THE PREPARATION OF INFUSIONS.

BY MR. THOMAS GREENISH.

The most desirable temperature for the water used in the preparation of some of the infusions of the Pharmacopœia, having been casually discussed on several occasions at our evening meetings, and my experience inducing me to differ from the opinions then expressed, it occurred to me that a few remarks on the subject might be productive of some benefit, more especially as it has again been adverted to in a paper read at the October Meeting, on the subject of a National Pharmacopœia. It is unnecessary before this Society to dwell on the importance of these preparations, the attention which has been already bestowed upon them is a sufficient evidence that they are by no means disregarded.

I shall confine myself on this occasion to the consideration of the methods which have been recommended for the preparation of infusion of calumba. This infusion is in frequent use, and is one of those most difficult to preserve from undergoing decomposition. Many Pharmaceutists recommend that the water for the preparation of this infusion should be either cold, or considerably under the boiling temperature, and the cold infusion by percolation has received the sanction of the Edinburgh College. I shall therefore endeavour, as briefly as possible, to state the result of some experiments I have made with reference to this infusion.

An infusion of calumba made with cold water, after being allowed to stand the specified time, which is two hours, and then strained off, will be very bright and free from starch; whilst, on the other hand, if made with boiling water, it will contain a considerable quantity of starch, and will not be quite so bright. The latter difference is caused by very fine particles held in suspension, which gradually subside; the difference between the two in strength and aroma appears quite trifling and unimportant.

If portions of the two infusions be kept under similar circumstances, that made with cold water will be observed to be several hours in advance of the other in the commencement and progress of decomposition; and if it be warm summer weather, symptoms of incipient change will very rapidly appear, being indicated by a general cloudiness, and the accumulation of small particles of insoluble matter on the surface of the hitherto bright infusion, which gradually extend themselves throughout the entire fluid. The precise time at which this takes place, will of course depend much on the state of the weather. The change, when it becomes visible, in the infusion made with boiling water, does not proceed so rapidly as in the one made with cold water, and if the infusion be examined from time to time during the progress of the decomposition, the large quantity of starch which it originally contained, will be found to be gradually disappearing, and ultimately a solution of iodine will not detect its presence—it will have totally disappeared.

Now the two substances which appear to be principally concerned in these changes, are, vegetable albumen and starch; and these bodies are known to be present in considerable quantity in calumba root.

Albumen, when in solution, is especially characterized by great instability, mere contact with atmospheric air being sufficient to induce rapid decomposition. Starch, on the other hand, is a much more stable body, and the changes which it undergoes are generally induced by the presence of some albuminous matter acting as a ferment.

When the infusion is made with cold water, the albumen is dissolved out from the root unaltered, and the presence of this body soon gives rise to decompositions which render the infusion unfit for use.

If the infusion be made with boiling water, the albumen will be partially coagulated, rendered less soluble, and not so liable to undergo decomposition. Nevertheless, it is probable that a portion of albuminous matter taken up, even in this case, by the water, is the cause of the subsequent change which is found to take place in the starch. Thus I find that if an infusion, whether made with cold or with boiling water, be subsequently heated to the boiling point, it will keep for a much longer time, without undergoing decomposition, than it otherwise would; and this seems to indicate the necessity of scalding out the infusion jug before making this infusion, so that the temperature of the water should be as near the boiling point as possible.

There are no doubt some cases in which it may be desirable to avoid the presence of starch in preparations of this kind, and this can only be effected by the use of cold or tepid water; but the increased tendency of infusion of calumba, when thus prepared to undergo decomposition, shows, I think, that there are serious objections to the general adoption of that mode of making infusions.

Mr. Squire thought the author of the paper had not shown sufficient reason for giving the preference to the method of preparing the infusion of columba with boiling water over that in which cold water was used. He thought it important to avoid the presence of starch in the infusion; by the use of cold water this object was effected, and although the albumen which would be taken up by the cold water would probably expedite decomposition, yet this could easily be removed, as the author of the paper had stated, by boiling the infusion after it was strained. He was disposed to give the preference to this method of making infusion of columba. The difficulty of preserving infusions, especially in warm weather, was a constant source of annoyance to the Dispensing Chemist, and it was very desirable to devise some efficient means of preventing or retarding the decompositions to which these preparations were subject. He had found that infusion of senna might be kept for as many days as it otherwise would keep hours, by the addition of a grain of nitrate of potash to each ounce of the infusion. Some Physicians, to whom he had mentioned this fact, had requested that the infusion of senna used in dispensing their prescriptions, should be made in that way.

Mr. Blanchard said he had made some experiments with the view of ascertaining the best method of preserving infusions. He had found chlorate of potash, in small quantity, to produce a similar preservative influence to that ascribed by Mr. Squire to nitrate of potash. It appeared, however, that the same agent was not equally efficacious with all the infusions. In some cases he had found the addition of a little ether to answer very well, and in trying the effect of this substance, it had occurred to him that, if infusions could by this means be preserved from decomposition, it would be easy to drive off the ether by the application of heat before using the infusion.

Mr. Waugh, while he agreed with the previous speakers that it was desirable to find out the best means of keeping infusions, thought there were serious objections to the adoption of any of the means which had been mentioned. The addition of a grain of nitrate of potash, or chlorate of potash, to every ounce of infusion, could not be considered an immaterial addition, and he thought it never would be sanctioned by medical men generally. He was anxious, also, to guard against the possibility of its being supposed by any one, that even if such additions could be proved to be beneficial, the Dispensing Chemist would be justified in adopting such a plan, without the express sanction of the prescriber. As a Member of the Pharmaceutical Society, he felt the great importance of avoiding in their discussions the appearance of any thing like a sanction of the slightest deviation, on the part of the dispenser, from the written instructions of the prescriber. There was, however, a method of preserving infusions which had not been alluded to that evening, which he had himself tried and found successful, and which appeared to be in every respect unobjectionable. He alluded to the method suggested some years ago by Mr. Alsop, which consisted in keeping the infusion in bottles perfectly filled and hermetically sealed, after being heated to the boiling point.

The Chairman said they could not be too careful in avoiding the use of expressions that might be construed into a sanction of any deviation from the instructions given in the Pharmacopœia, or specified by prescribers. He should be very imperfectly fulfilling his duty in that chair were he to pass unnoticed any observations that would admit of such a construction; yet the meeting was glad to receive from the Members present such practical information as had been given them that evening, with a view to the improvement of the formulæ of the Pharmacopœia, when a revision of that work took place.

Mr. Blanchard begged it to be distinctly understood, that in the remarks he had made, he had never contemplated the use of any salt as a preservative agent to infusions, if it were not ordered by the prescriber. He had merely mentioned the result of his experiments for the information of those who might feel interested in the subject.

Mr. Redwood corroborated the statement made by Mr. Waugh with regard to the efficacy of the method originally suggested by Mr. Alsop, for the preservation of infusions. He had frequently tested this very simple method, and considered it to be quite unobjectionable. Any of the infusions may be preserved for several weeks, by putting them into six or eight ounce bottles filled to the brim, after being previously heated to the boiling point, so as to expel atmospheric air, and the mouths of the bottles covered with tinfoil. He had kept some of the infusions for twelve months without their being at all injured, by securing the total exclusion of air.

ON THE RECOVERY OF STARCH FROM ROTTEN POTATOES.

BY MR. HENRY DEANE.

The following case may not be uninteresting at the present time, as it shows the resistive power of starch to the ordinary influences of vegetable decomposition.

A gentleman living in this neighbourhood, four years ago (in 1841), made a pit in an outhouse for the purpose of preserving his winter stock of potatoes. The pit was made and filled with potatoes in dry weather, but when the winter had set in, it was found to be nearly full of water, and the potatoes to be so far decayed as to be considered worthless. Accordingly, they were buried in a large hole, about three feet deep, in the garden, covered with earth to the thickness of about a foot or two, and thus left, as was thought, to rot and become converted into manure. A few weeks since, on digging over the spot where these potatoes were buried, a white mass was turned up, which proved to be part of the remains of the potatoes. A careful examination of the spot was now made. The potatoes, which originally occupied a space about two feet deep, were found compressed into a layer of eight or nine inches in thickness. The upper part of this layer consisted of a mass of white powder, which, on being examined by the microscope, was ascertained to be pure and perfect starch. In the lower part of the layer, the cortical portion of the tubers, as well as the starch, still remained; thus each potato, in a flattened state, like a dried fig, could be separated from the rest, and on removing the dry peel, the interior was found to consist of the starch, nearly pure, but a little more coloured than that in the upper part of the layer. These flattened remains of the potatoes have a strong and most offensive smell; but the starch, on being washed, is

as sweet and white, and in every respect as good, as that obtained from fresh and sound potatoes, although it has been buried in the ground, and has remained in contact with the decaying portion of the tubers during a period of full three years and a half.

The surface of the decayed potatoes was covered with an immense number of earth worms, completely matted together, and the mould for six or eight inches above these was full of maggots, similar to those of the common house flies; but neither worms nor maggots were found among the decayed potatoes.

Clapham.

Mr. Tosswill thought the fact communicated by Mr. Deane a very interesting one. The resistive power of the starch to those influences which had determined the decomposition of all the other constituents of the potatoes, depended, he conceived, upon its being an organized body, possessing a certain amount of latent vitality in its separate particles. These beautifully organized particles contained the nutriment laid up in store for the young plant, against the commencement of vegetation. The fact before them showed how well adapted they were for the purpose intended, for although easily decomposed and assimilated to substances essential to the vegetable economy, when submitted to agencies which were active in the living plant, yet how comparatively indestructible were they found to be under other circumstances. To his mind it afforded a strong evidence of design, and an instructive illustration of the wisdom of the Creator.

The Chairman stated that the next paper to be read was from the Scientific Committee, and was written by a member of the Committee who was at present abroad.

ON COCHINEAL.

BY AUGUST FABER, ESQ.

(*Extracted from a Letter dated Madeira,* Oct. 18, 1845, *addressed to Dr. Pereira.*)

On board the "Tay" West India steamer, in which I came out, there was also as passenger, Mr. Innis, merchant, going out to Vera Cruz. His residence is in the city of Oaxaha (pronounced Oa*h*aka) in the province of that name, where chiefly cochineal is grown. The following information, which I obtained from him, is in several respects very interesting:—

1. "Silver cochineal is the impregnated female just before laying eggs: black cochineal is the *female after laying and hatching the eggs.*"

2. "The female just before laying the eggs, spreads out a large quantity of white powder immediately around her,

and to a great distance in a circle; and the Mexican growers are in the habit of blowing this white powder off the plant as much as possible, saying the young do better without it."

Now we begin to know something of the origin of the difference of colour and shape and *quantities,* in this way: the black, if good, is always *shelly,* the real silver is *never* shelly; and of black cochineal, there is never more than one bag in twenty, or in thirty, or fifty imported, being in fact only what had been kept for seed.

The last quotation given above, would suggest to me one more possible fact.

Why, I would ask, is the Honduras cochineal (which, in fact, grows in Guatimala), *invariably* brilliant in colour (silver), while the Mexican is *invariably* dull, the latter fetching threepence and fourpence per pound less than the former? I consider it very probable, that the habit of blowing off what is given by nature, namely, the white powder deposited by the females, may be the reason not only of the dulness of the colour, but also of the generally smaller grain.

3. Mr. Innis told me further, that the more extensive cultivators never kill the insect by immersion, but only by the basket being placed in heated rooms or stoves. The smaller and poorer cultivators use hot water, "by which the insect is mostly burst open, and the 'foxy' colour produced."

"Foxy" is the technical London name for silver cochineal, rather reddish, and very different from the fine transparent red, which forms the finest black.

As I am upon this article, I beg to add a few remarks, more strictly commercial :—

1. The serons in Guatimala are made up to 150lbs. a mule *there* not being able to carry more than 300lbs. over the mountains. In Vera Cruz, the distance from shore is 300 miles, but not being so mountainous, the mules carry 400lbs., the serons being made one-third larger than at Guatimala.

2. In London, every seron of cochineal on its arrival, is turned out and sifted by the dock companies, filled into English bags, on which the tare to the ounce is marked, the dust of a whole parcel (of 100 to 500 bags) being put together and sold separately from the grain. The invariable custom of sifting exists in no other port than in London.

3. There still exists as an article of commerce, but only just still exists, the sort called "English dyed black cochineal."

When, in 1826, I established myself in London, this article was extensively shipped to India, Russia, and Austria, and for a number of years my Price Current had the quotation of "English black cochineal;" and, in fact, being cheaper in many places, they would not have the genuine black. It was Mexican silver grain *dyed*, and prices were about the following:—Genuine black, 6*s*. 6*d*.; English dyed, 5*s* 6*d*.; Honduras silver, 5*s*. 6*d*.; Mexican silver, 5*s*.

Note added by Mr. Wood, Mr. Faber's clerk:—

Granilla is imported from the same places as the cochineal, namely, Honduras and Mexico, and consists of the very small immature insects. Its value is from two shillings to four shillings per pound, according to quality.

Garblings consist of the broken pieces of the insects, mixed with the dust and extraneous substances that must of course be gathered with the insects in taking them from the plants. As garblings contain generally a good proportion of the broken particles of matured insects, they are frequently preferred to granilla, unless the latter be of unusually good quality. The value of garblings is two shillings to two shillings and sixpence per pound. Each bag of cochineal is sifted here on importation, and it is in this manner that the garblings are obtained, as they are seldom imported so.

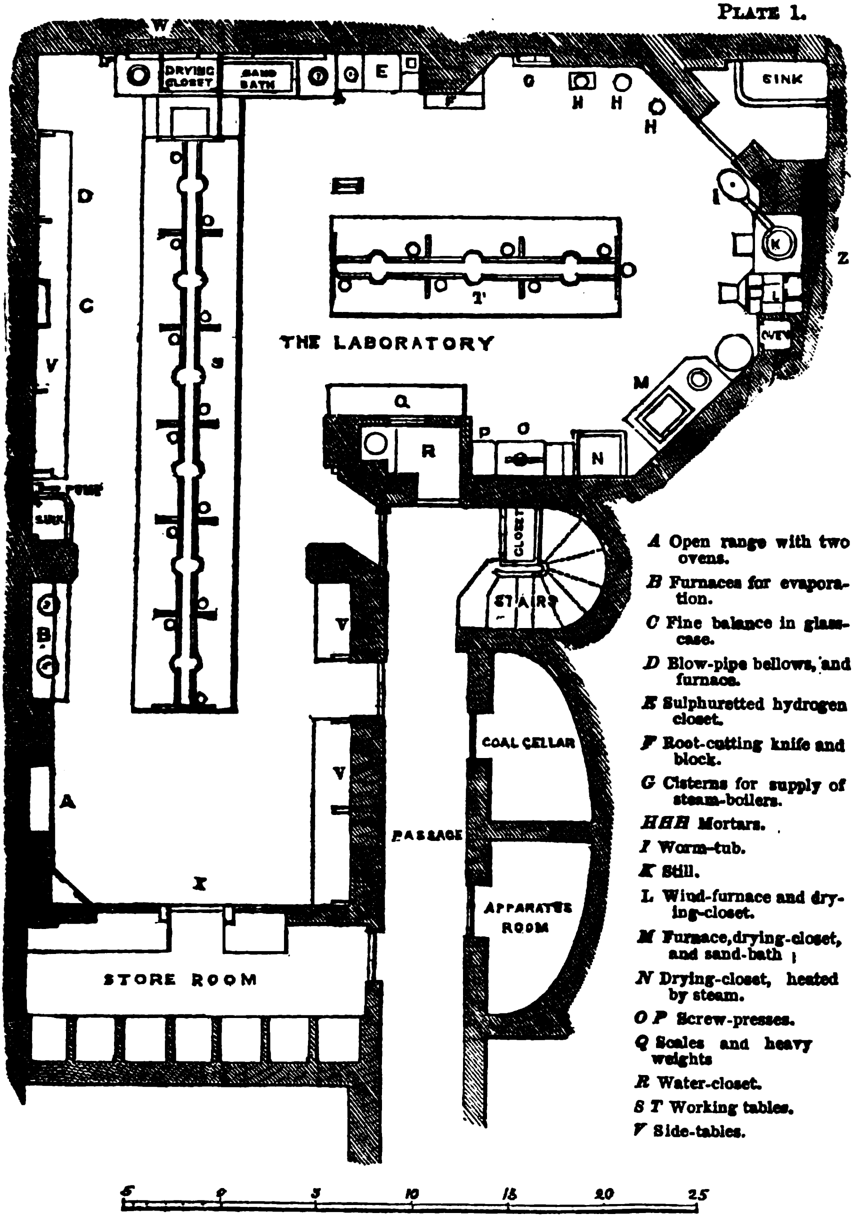
The following is a table of the quantities of cochineal exported from and consumed in England in the last twelve years:—

	lbs.		lbs.
1833	309125	1839	1010193
1834	405350	1840	1330295
1835	516132	1841	1439742
1836	604425	1842	1207920
1837	517882	1843	1457456
1838	536044	1844	1569120

THE LABORATORY OF THE PHARMACEUTICAL SOCIETY.

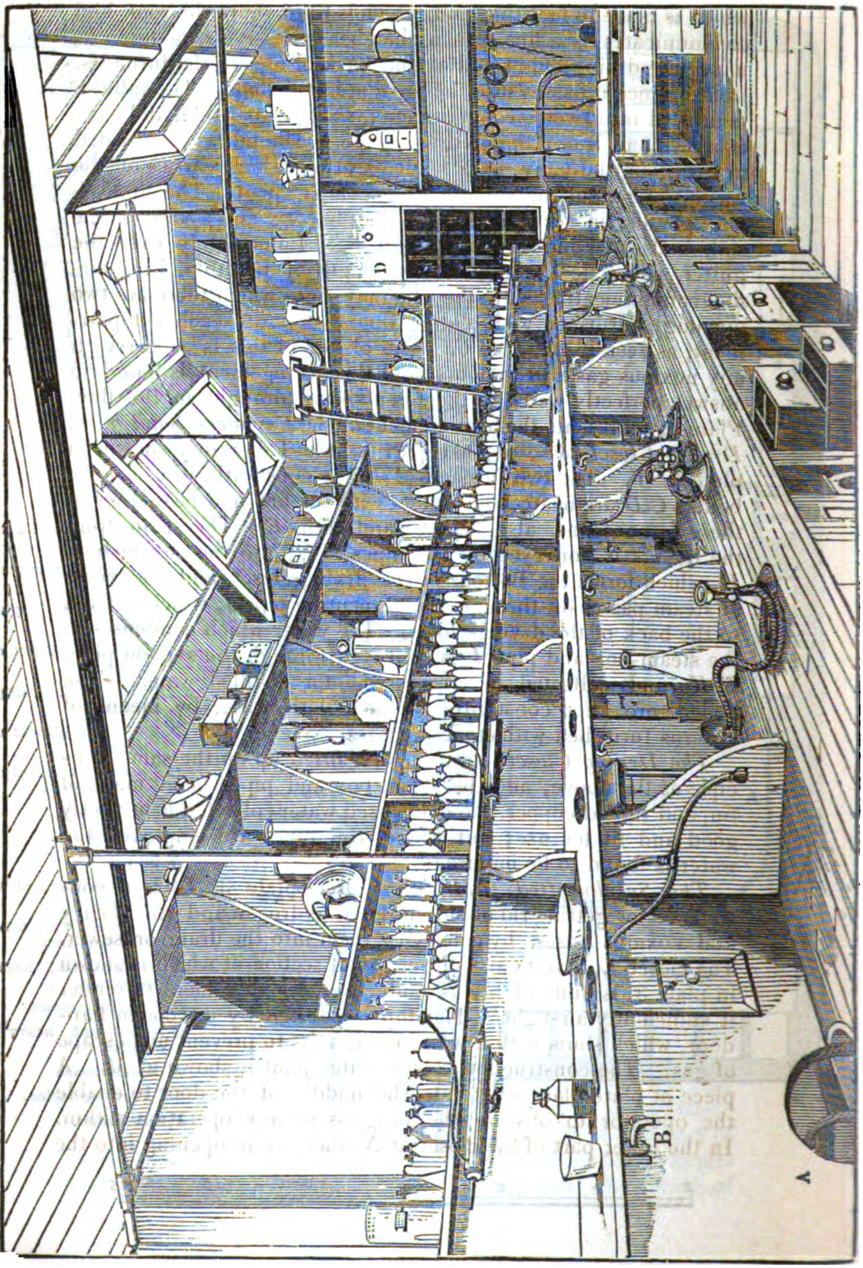
According to promise, we proceed to give a description of the Laboratory recently fitted up, for affording practical instruction to students, at the establishment of the Pharmaceutical Society. Plate 1, represents the ground-plan of the Laboratory and the general arrangement of the apparatus. Plate 2, represents a view of one side of the principal working table, with the drying-closet, sand-bath, and furnaces, at the end of the room. The construction and arrangement of these last-named, is further illustrated by plate 3. Horizontal sections of the working tables are given in Plate 1, *S* and *T*. In the floor, immediately under the table *S*, and extending the whole length of that part of the room, there is an air-flue for supplying fresh air to the apartment. This is introduced by means of a large cowl, the mouth of

PLATE 1.



A Open range with two ovens.
B Furnaces for evaporation.
C Fine balance in glass-case.
D Blow-pipe bellows, and furnace.
E Sulphuretted hydrogen closet.
F Root-cutting knife and block.
G Cisterns for supply of steam-boilers.
HHH Mortars.
I Worm-tub.
K Still.
L Wind-furnace and drying-closet.
M Furnace, drying-closet, and sand-bath ;
N Drying-closet, heated by steam.
O P Screw-presses.
Q Scales and heavy weights
R Water-closet.
S T Working tables.
V Side-tables.

PLATE 2.

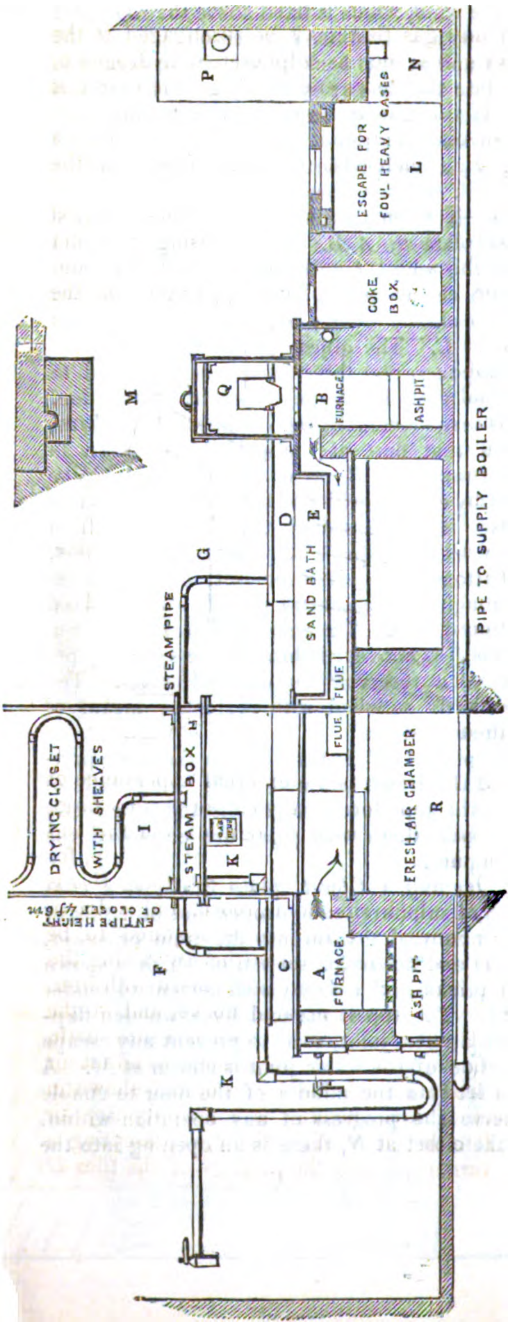


which is made to face the wind, which is fixed above the roof, and communicates by a flue with a chamber or reservoir, plate 3, *R*, under the drying-closet and at the back of one of the furnaces, from whence it passes into the air-flue in the floor. The table *S* is divided into twelve compartments, six on either side, and each compartment is appropriated to a pupil. The tables are divided in two, longitudinally, by a leaden gutter, which carries off the waste water from the sink in each compartment. The appearance of this, in section, is given in plate 1; and a view of the sink and water-tap in plate 2, *A B*. Immediately over the gutter, and extending the whole length of the table, is an air-flue communicating with the chimney, into which there are two openings, furnished with sliding doors, opposite each compartment, as seen in plate 2, *C*. The object of this is to carry off any noxious gases or vapours, and this arrangement is found to answer perfectly well, as there is a strong draught in the flue. Plate 3, represents the arrangement of the *Furnaces*, *Sand-bath*, *Drying-Closet*, *&c.*, in that part of the Laboratory shown in plate 1, *W*. The two furnaces *A B*, are constantly in use. The boilers *C D* are heated by contact with the fire and heated air of these furnaces, as, also, is the sand-bath, *E*. The steam from the boilers is conveyed by the pipes *F G*, into the steam-box, *H*, which forms the bottom of the drying-closet, and the excess of steam passes off through the serpentine pipe *I*, which is fixed to the back of the drying-closet. The water which condenses in the steam-box and pipe *I*, is conveyed through the syphon pipe, *K K*, and collected in a reservoir for distilled water. The boilers are kept constantly supplied with water by means of cisterns furnished with stone floats.

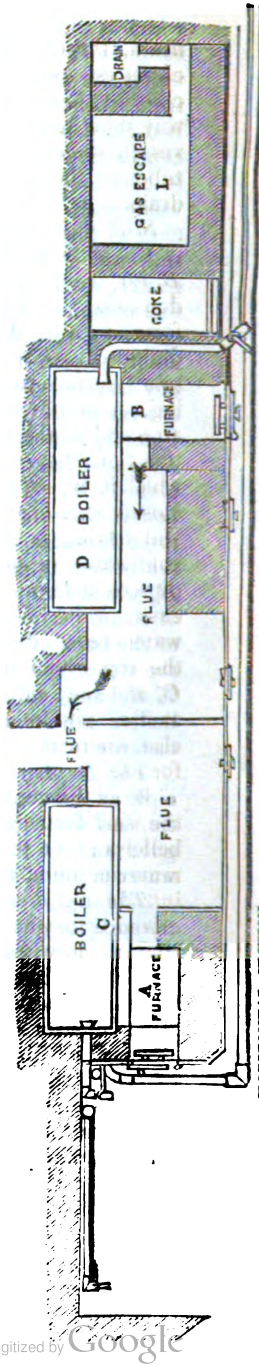
The Drying Closet, plate 1, *N*, is fitted up on the same principle as the above, and the steam-box and pipes being made of tin, and tinned copper, the condensed water collected is perfectly good and fit for use; but where iron pipes are employed the water is found to be impure.

The Sulphuretted Hydrogen Closet, plate 3, *L*, is a contrivance for getting rid of sulphuretted hydrogen and other heavy and noxious gases, by conveying them into the drain or sewer. The closet *L*, a vertical and horizontal section of which is shown in plate 3, is built of bricks and covered with cement to render it sufficiently air-tight The top is covered by a wooden flap-door, which shuts with a water joint, so as to prevent any escape of gas. The construction of the water joint is shown at *M*. A piece of plate glass is let into the middle of the door to enable the operator to observe the progress of any operation within. In the lower part of the closet at *N*, there is an opening into the

PLATE 3.



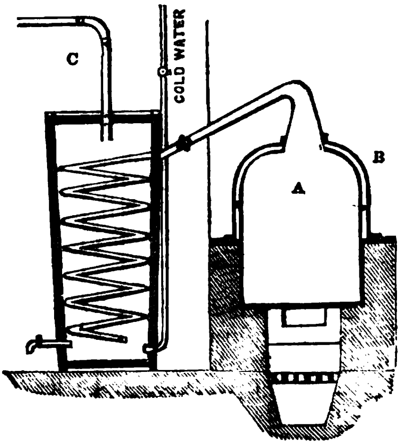
VERTICAL SECTION.



HORIZONTAL SECTION.

drain, through which any gas that may be disengaged in the closet escapes. Heavy gases, such as sulphuretted hydrogen or chlorine, are found to be much more effectually got rid of in this way than any other. If the gas is disengaged from any close vessel, such as a two-necked bottle, it may be conveyed by a tube to the opening *P*, which also communicates with the drain.

Still and Worm-tub.—The only peculiarities in these, consist in the body of the still *A* having an external casing or jacket *B*, for the purpose of checking the radiation of heat and condensation of the steam in this part of the apparatus; in the form of the head, which is designed to present a small surface to the cooling action of the external air; and in the construction of the worm-tub, which consists of a cask closely encasing the worm, and having a current of cold water supplied by a pipe to the bottom of the cask, while the heated water is carried away from the top by another pipe, *C*, and may be delivered at the sink, or anywhere else where it is required for use.



Wind Furnace.—Fig 1 represents the external appearance of the wind furnace. *A* is a pipe for conveying air from a forge bellows; *B* a strong double door, used in lighting the fire and removing clinkers from the bars; *C* an opening at the top, for introducing the crucible, and for supplying fresh fuel; this is closed by a sliding tile *D*, which runs in a groove, and is drawn to one side when the mouth of the furnace is required to be open. The opening may be extended still further by raising the tile *E*. These tiles are made of fire-clay, and cased with iron. *F* is the door of the drying closet, situated above, and at the back of the furnace. The bottom of this closet is a sand-bath, heated by the flue of the furnace. *G* is an opening to admit air into a chamber immediately behind the furnace, and shown in fig. 2, *H*. The object of this chamber is to supply dry air through the channel *I* to the closet *K*. Fig. 2, representing a vertical section of the furnace, shows the position of the tiles *D*

E'. At *L* there is a notch in the brick-work for receiving moveable bars, which are sometimes used to support a crucible in the middle of the fire.

Fig. 1.

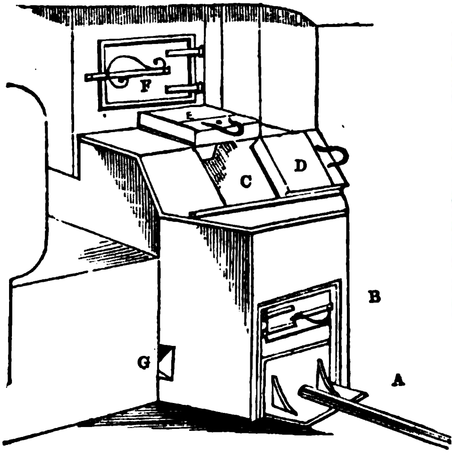
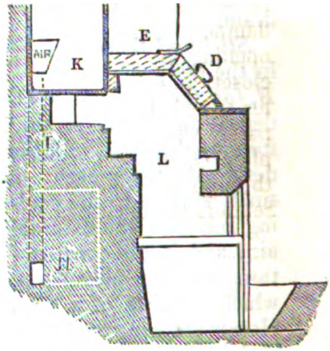


Fig. 2.



Furnace, Sand-bath, and Drying Closet.—Fig. 3 represents the top of the furnace and sand-bath; fig. 4 the front elevation, showing the furnace and drying-closet doors; fig. 5 a horizontal section from *C* to *D* of fig. 4; fig. 6, a vertical section from *A* to *B* of fig. 3.

Fig. 3.

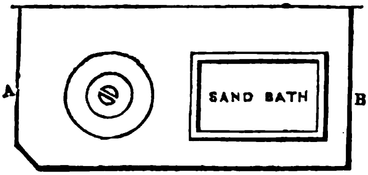


Fig. 5.

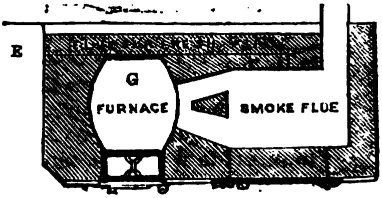


Fig. 4.

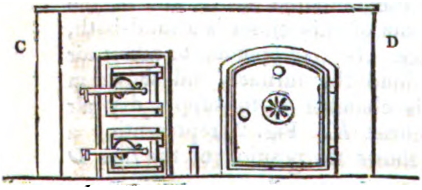
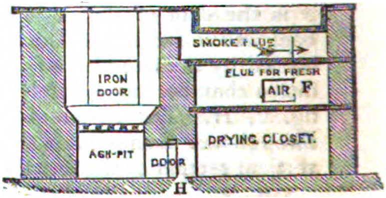


Fig 6.



At the back of the furnace there is a channel *E*, through which air is conveyed to the closet, which it enters at *F*. This channel being only separated from the fire in the furnace by a plate of iron *G*, the air, in passing through it, becomes heated before entering the closet. Between the bottom of the closet and the ash-pit of the furnace, there is a communication, *H*, which may be opened or shut at pleasure, by means of a sliding door or damper. Thus, on closing the external ash-pit door *I*, and opening the communication *H*, between the ash-pit and drying-closet, a current of warm air is determined through the latter, for the whole of the air supporting the combustion in the furnace, passes through the channel *E*, in contact with the heated iron plate *G*, into the upper part of the closet at *F*, and ultimately through the opening *H*, into the ash-pit. This arrangement renders the drying-closet an exceedingly efficient one.

FIG. 7.

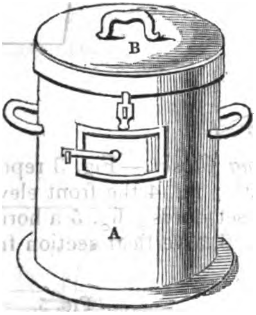
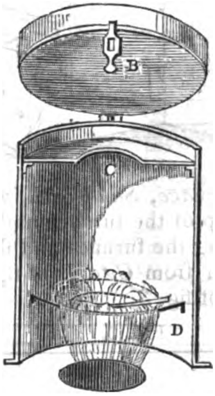


FIG. 8.



The Furnace Hood.—This is a contrivance for effectually getting rid of some noxious gases, such as those disengaged in the preparation of nitrate of copper, or sulphate of mercury. *A* is a cylinder fourteen inches in diameter, and eighteen inches high, made of galvanized iron, painted; it is open at the bottom, furnished with two handles attached to the sides, and one to the centre of the lid, and a door, as seen in fig. 7. The lid opens as represented in fig. 8, and immediately under the lid is a moveable plate *C*, which rests on a ledge, and has a circular hole, six inches in diameter, in the centre. About four inches from the bottom there is a ring six inches in diameter, attached by three supports to the sides of the cylinder, as seen in fig. 8 *D*. The *furnace hood* is intended to be placed over the open mouth of a ring-topped furnace, as shown in fig. 8. The lid being opened, and the plate *C* removed, a Wedgewood dish, or other similar vessel, is introduced at the top, and placed on the ring *D*; the plate *C* is now returned to its place, and the ingredients to be operated upon put into the dish through the door, or through the opening at the top. The dish is of course exposed to the heat of the furnace, and any gas or vapour disengaged is carried into the furnace by the pressure of the superincumbent cold air, as shown in fig. 8; also in plate 3. Q.

Gas Furnaces, such as those represented in figs. 9, 10, and 11, are constantly used by the students. Those represented by figs. 9 and 10, are cylinders made of iron plate, japanned, with a small door for lighting or regulating the flame, a number of small holes round the top for the escape of the heated air, and openings at the bottom for the admission of cold air. These are placed over the gas burners attached to flexible tubes, as shown in the drawing, plate 2, and in fig. 9.

FIG. 9.

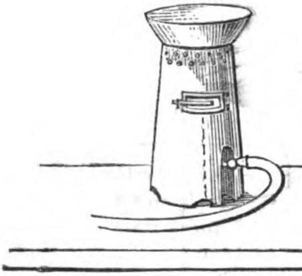


FIG. 11.

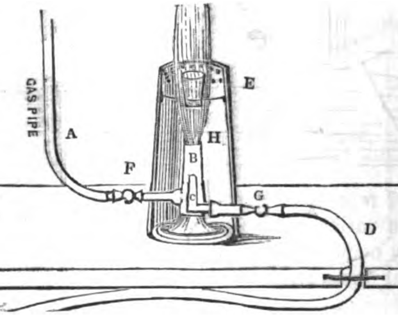


FIG. 10.

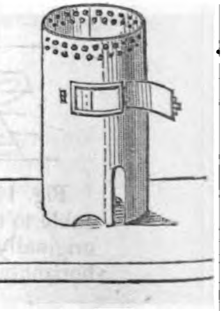


Fig. 11 represents a *gas blow-pipe furnace.*—*A* is a flexible pipe conveying gas into the tube *B*, which is open at its mouth. *D* is another flexible tube, conveying air from a double bellows fixed under the table, and worked by the foot, to the tube *C*, from the top of which it issues through a small opening in the middle of the tube conveying the gas. *F* and *G* are two stop-cocks for regulating the supply of gas and air. The stop-cock *F* is first opened, and the gas lighted at the mouth of *B*. The stop-cock *G* is now opened, and a current of air forced into the middle of the gas flame by means of the bellows. A large blue flame is procured in this way, which affords an intense heat. The furnace *H*, which is similar to that shown in fig. 9, is placed as represented, and in the upper part of this, at *E*, there is a support for a crucible.

FIG. 12.

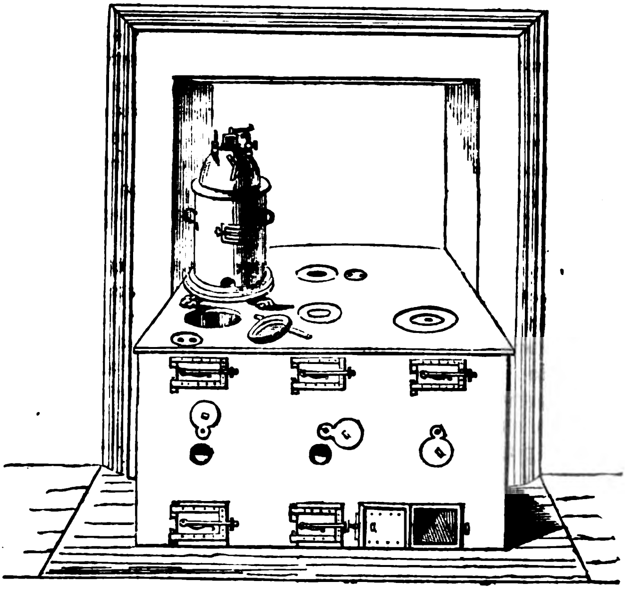


Fig. 12 represents a very convenient set of furnaces, applicable to a variety of purposes. They are fitted into an opening originally occupied by a common stove. Figs. 13 and 14 are horizontal and vertical sections.

FIG. 13.

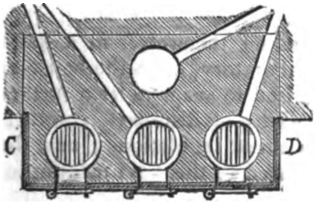
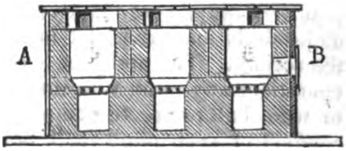


FIG. 14.



We have now described that portion of the fittings and apparatus which we think most likely to interest or benefit our readers, either from their novelty or adaptation for the purposes designed. They have all been fitted up under Mr. Redwood's directions, and whatever originality may attach to any of them is due to him.

The following are the Regulations to be observed in the Laboratory:—

1. The Laboratory shall be open from nine o'clock in the morning until six in the evening, daily, excepting Saturdays, on which day the studies of the pupils shall be conducted in the library and museum of the society. The pupils must quit the Laboratory by six o'clock to enable the assistant to proceed with the necessary cleaning and arrangements for the following day.

2. The professor shall assign to each pupil the operations to be performed, and shall provide the necessary apparatus and materials.

3. Such operations only shall be performed in the Laboratory as are sanctioned by the professor; and his directions must be followed by the pupils in the methods of conducting them.

4. The apparatus and materials required by the pupils will be supplied to them from the store-rooms by the assistant, who alone is authorised to take anything from the store-rooms, and he only by an order from the professor.

5. The pupils are required to use the apparatus and materials supplied to them, with care and economy; and in case of any wilful or culpable destruction or waste of the same, they will be called upon to pay for them.

6. The products of every operation are the property of the society; but the pupils will, on application to the professor, be allowed to retain specimens of those products which have been prepared by themselves.

7. Each pupil will have certain articles of apparatus given to him for his use, and he will be held responsible for the careful keeping and restoration of these. He is required always to clean the apparatus after using it; and to keep his work-table and utensils clean and in good order.

8. The pupils are required to conduct themselves in a quiet and orderly manner whilst in the Laboratory, or in the house of the society. The professor is authorised to suspend from further operations any pupil who shall be guilty of disorderly conduct, or who shall refuse to comply with these regulations; and the conduct of such pupil shall be reported to the next meeting of Council.

ORIGINAL AND EXTRACTED ARTICLES.

ANIMAL CHARCOAL AN ANTIDOTE TO POISONS.

On Monday, November 17th, 1845, Dr. A. B. Garrod read a paper before the Medical Society of London, on Animal Charcoal as an Antidote to various Poisons, especially those derived from the animal and vegetable kingdoms. The following is an abstract of the paper, which will appear in the forthcoming volume of the Society's Transactions:

Dr. Garrod first noticed the experiments which had of late been made on the effects of animal charcoal in removing bitter principles from their solution, and then detailed his own experiments, which led him to use it as an antidote. The results he had arrived at were,

1st. That animal charcoal removed the active principles from vegetable and animal substances when added in proper quantities, even in a solution imitating the gastric juice, and at the temperature of the stomach (100° Fahr.)

2d. That animal charcoal will also form compounds with arsenious acid and other mineral substances, removing these from their solutions, and that it is quite equal, if not superior, to the hydrated sesquioxide of iron, as an antidote to arsenious acid.

3d. That the compounds of the animal charcoal with the poisonous principles have no injurious action on the animal body, and therefore, when the charcoal is given with the poison, or before it has become absorbed into the system, it will act as an antidote.

4th. A certain amount of the antidote is required, depending on the quantity of active principle contained in the poison, half an ounce is more than sufficient for twenty grains of nux vomica, or one grain of strychnia; if less is given, the poison may act by its excess above the antidote.

5th. The antidote is peculiarly adapted to poisonous substances whose activity depends on a small quantity of an active principle, as opium, nux vomica, the aconites, belladonna, stramonium, tobacco, hemlock, &c.

6th. The antidote itself may be given to almost any amount, as it exerts no injurious action on the body.

7th. That it is of great importance that good animal charcoal should be used, not the bone or ivory black, which contain about $\frac{93}{100}$ of earthy matter, but the *carbo animalis purificatus* of the London Pharmacopœia. Common bone black was found to be very far inferior, certainly not possessing a fifth of the antidotal power. The vegetable charcoal was comparatively inert.

Dr. Garrod proposes, that in cases of poisoning we should remove as much of the poison as possible by means of the stomach-pump or emetics, and then give a large quantity of the animal charcoal diffused in warm water, or the antidote may be given with the emetic, but ipecacuanha must not be used, as the charcoal would destroy its emetic property. Sulphate of zinc or some other mineral emetic should be chosen. Dr. Garrod also suggests that perhaps animal charcoal would prevent the action of the poison of rabies, syphilis, serpents, &c., if applied in the form of a poultice to the part which has come into contact with the poisons, and that it may prove serviceable as a remedy in some diseases, from its great power of absorbing all principles.

ON THE PRECIPITATION OF DIFFERENT ORGANIC AND INORGANIC SUBSTANCES BY ANIMAL CHARCOAL.

BY F. WEPPEN.

FROM the fact that animal charcoal precipitates a number of very different colouring matters from their solutions, it was presumed that this effect was not limited to colouring matters, and the presumption has been substantiated by the following experiments, which show that animal charcoal likewise precipitates bitter substances, resins, and substances containing tannin. The charcoal used for these experiments was obtained from bone-black by repeatedly boiling it with muriatic acid; afterwards well washing it, and then exposing it to moderate red heat.

I. ORGANIC SUBSTANCES.

§ 1. *Bitter Substances.*—Ten grains of the substance were digested with two ounces of boiling water, and the filtered infusion shaken with the charcoal, until the bitter taste had entirely disappeared.

Names of the bitter substance.	Quantity of charcoal.
Wormwood	30 grains.
Colocynth	30 "
Gentian Root	20 "
Columbo Root	10 "
Quassia	30 "
Cascarilla Bark	30 "
Menyanthes trifoliata	30 "

A solution of two grains of *extract of aloes* in two ounces of water, became quite tasteless with forty grains of charcoal.

2. *Resins.*—One drachm of the tincture of *guaiacum* and of the tincture of *jalap* were respectively diluted with as much alcohol; the first required thirteen grains, and the latter twenty-five grains of charcoal to precipitate the resin contained therein to such a degree, that the solution became only very slightly clouded upon the addition of water.

3. *Astringent Substances.*—A solution of one grain of extract of *nutgalls* in half-an-ounce of water required twenty grains of charcoal; a solution of half-a-grain of *pure tannin* dissolved in half-an-ounce of water required ten grains of charcoal; an infusion of ten grains of *rhatany root* and the same quantity of *cinchona bark* in two ounces of water, required twenty grains of charcoal to deprive them of their power of reacting on the salts of iron.

II. INORGANIC SUBSTANCES.

That animal charcoal precipitates certain *metallic salts* from their solutions in water or spirit of wine, is a fact which has been long established. I find that probably all metallic solutions are similarly affected, though some require more charcoal than others. Moreover, this effect does not depend on the chemical constitution of the metallic oxide, whether its formula be $M O$ or $M_2 O_3$.

The following salts were subjected to experiment:—

Sulphate of copper
" " zinc
" " protoxide of iron
" " oxide of chromium
Nitrate of oxide of mercury
Acetate of lead
Emetic tartar

Chloride of tin
Corrosive sublimate
Acetate of the oxide of iron
Nitrate of nickel
" " protoxide of cobalt
" " silver
" " protoxide of mercury

On an average, thirty grains of charcoal were required for every grain of these salts, dissolved in half an ounce of water; but, for reasons hereafter mentioned, it was difficult to precipitate them entirely, the addition of charcoal only rendering the reaction less distinct.

If caustic ammonia be added to those salts whose bases cannot be precipitated by ammonia, or which are redissolved by excess of the precipitant (copper, zinc, silver, lead n sugar of lead) much less charcoal is required;

and the precipitation takes place much sooner. Not merely basic metallic oxides, but also certain metallic acids are precipitated by charcoal; oxide of lead dissolved in caustic potash was precipitated by charcoal; also the acids from antimoniate of potash and tungstate of ammonia. On the other hand, no effect was obtained on arseniate and arsenite of soda; and arsenious acid dissolved in water could not be entirely precipitated by animal charcoal. Bichromate of potash and chromic acid were reduced by the charcoal, in the cold slowly but yet completely. The chromate of potash became converted into carbonate of potash. Furthermore, the charcoal precipitated iodide of mercury from the ammoniacal iodide of mercury; and sulphuret of antimony from the ammoniacal sulphuret of arsenic.

A solution of iodine in water or in iodide of potassium is quickly decolourized by charcoal; but it is impossible to precipitate sulphur from its solutions in alcohol or oil of turpentine; for even after a large addition of charcoal, the filtered fluid heated over a silver plate still yielded traces of sulphuret of silver.

Salts having an alkaline base, as cream of tartar, ferrocyanide of potassium, gypsum, and alum, and also lime-water, appeared to be unaffected by charcoal; but a reaction takes place on chloride of barium, particularly if a few drops of caustic ammonia be added to the solution.

In the precipitation of metallic salts by charcoal, three circumstances may happen:—1. The salt may be absorbed without decomposition. 2. The oxide contained in the salt may be reduced; or 3. The salts may be precipitated in a basic state. With some of the salts (sulphate of the protoxide of iron and corrosive sublimate) the latter takes place. As soon as the charcoal begins to act, the solution of the salt becomes distinctly acid, and by quantitative examination, the greatest part of the acid will be again found in the fluid. This separation of the salts into acid and basic compounds is the reason why the last traces of the bases are so difficult to be removed by charcoal; for the acid which has become free prevents the perfect precipitation. Hence also, a salt to which some free acid has been added, is but little or not at all affected by charcoal. So also if we boil with acid the charcoal which has been used for precipitation, the precipitated oxides or basic salts contained therein, can almost entirely be extracted, though the last traces of the same resist the action of the acids.

Mulder mentions in his *Physiology*, that lead can be precipitated in the metallic state from sugar of lead, by means of charcoal. If this were the case, no oxide of lead could be extracted by boiling the washed charcoal in acetic acid. Whether easily reducible, metallic oxides, for example, oxide of silver, can be reduced to the metallic state by charcoal, I have not ascertained.

It has lately been asserted that the precipitation of the metallic salts by charcoal depends on the calcareous salt, which cannot perfectly be extracted by the application of acids. If this were the case, by the application of a salt, whose acid forms a very easily soluble combination with lime, a calcareous salt would be found in the liquid standing over the charcoal.

In order to determine this I dissolved ten grains of corrosive sublimate in two ounces of water, and shook this with ten scruples of charcoal. The acid liquor was filtered, deprived of every trace of mercury by sulphuretted hydrogen, and evaporated. The last drops of the liquid certainly showed distinct traces of lime. The charcoal used in this experiment was then boiled with muriatic acid, washed, and again mixed with ten grains of a solution of corrosive sublimate. In both the second and third trials traces of a calcareous salt were found in the liquid. When the charcoal, which had been used in all three experiments, was deflagrated with nitrate of potash, and the saline mass dissolved in water, a very small residue only was obtained; which, moreover, was only partially soluble in muriatic acid. It, therefore, appeared to me improbable, that a salt of lime should be extracted out of it by means of a solution of corrosive sublimate, rather than by means of muriatic acid. And, moreover, if this even had been the case, the contained calcareous salt would have been removed after I had three times treated the charcoal with corrosive sublimate. The calcareous salt, therefore, must have originated either from the water, or from the vessels, in which the fluid had been evaporated. In fact, after an equal quantity of water had been evaporated in a porcelain capsule, to a few drops, and only one drop of muriatic acid added, I obtained distinct evidence of the presence of lime on the addition of oxalate of ammonia. Moreover, as charcoal also precipitates substances, where the precipitation cannot depend on the presence of calcareous salts, as in the case of iodine, it is very improbable that the effect on metallic salts depends on the calcareous salts.—*Ann. der Chimie*, Bd. iv., Heft 2.

POTATO DISEASE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—I trust you will not think the few remarks I am about to make on the potato disease to trespass on your space too much. I, like many others, was induced to try some remedy for the twofold purpose of preserving the seed and checking the disease. In the early part of November, I procured two sacks of potatoes, the one having grown on high land, the other on fen land. After sorting the whole, taking particular care to separate the diseased and those cut by the fork, I placed the sound potatoes in a dry loft on straw exposed to a current of air for a week; after that time, I placed them in large *crates*, in layers of potatoes and straw, exposing the sides to the full action of the sun and air daily. The diseased potatoes from the high land, I put into a mixture of whiting and water for about five minutes, then exposed them to dry for two days, and placed them in the same form as the others. The diseased potatoes of the fen land I exposed to chlorine gas for twelve hours (proposed by Mr. Tatershall), and after drying, laid them in saw-dust. I now find after six weeks trial, the whole of the potatoes are perfectly sound, including those placed in the whiting and water.

Your obedient servant,

Bourn, December 15, 1845. ROBERT M. MILLS.

ON THE POTATO DISEASE.

BY ANDREW URE, M.D., F.R.S.

THE vague and contradictory statements concerning the nature of this calamitous visitation of Providence, as well as the directions for the treatment and preservation of the tubers, generally impracticable and preposterous, which have recently issued in vast variety from the press, do little honour to economic chemistry. It is needless to notice all the notions and schemes which have either officially or spontaneously been projected. Only two of these deserve comment; the first, as coming from a great master in science; the second, as emanating from the Irish Commissioners.

Professor Liebig imagines the essence of the disease to consist in the conversion of the albumen, a usual constituent of healthy potatoes, into caseine, a principle which, by its great instability of composition, is supposed to cause the potato to putrefy rapidly. I have subjected this opinion to the test of experiment. Perfectly sound potatoes, as also diseased ones, were sliced or grated, and separately digested in a very dilute alkaline ley at a blood heat. The infusions, when cool, being filtered and faintly acidulated with dilute acetic acid, afforded respectively a like proportion of caseine-looking flakes. It would thus appear, from this mode of testing, as prescribed by M. Dumas in the seventh volume of his *Traité de Chimie*, that sound potatoes contain as much caseine as unsound.

Professor Liebig's plan of preserving diseased potatoes is founded on the above notion, and consists in cutting them into slices one quarter of an inch thick and steeping them twenty-four or thirty-six hours in dilute sulphuric acid. On this proposal I need make no comments, as it has no chance of being practised beyond the precincts of Giessen.

In the *Pharmaceutical Journal* for October last, I inserted a few observations on diseased potatoes, chiefly with a view of showing, that till the putrefactive stage commences, the potato had the same acidulous reaction as in the sound state, but that *then* a portion of ammonia made its appearance, as was proved by its alkaline action on litmus paper, and by its coming over in distillation. That brief notice was written while I was at a distance from home on professional business, and where I had no means of prosecuting my experiments. At my first period of leisure since, I resumed my inquiries, and have obtained certain results which may probably be found useful, as well as interesting. Before entering into a detail of them, I shall shortly describe the constituents of sound potatoes, according to the most authentic analyses. Their average composition in 100 parts, according to Einhof and Lampadius, is—fibrous matter, 7; starch, 15; vegetable albumen, 1; gum, acids, and salts, 3.5; water 75. Besides these principles, Vauquelin, by his older and more minute analysis, discovered the following in minute quantities:—crystallizable asparagin; an azotised substance resembling gum: a resinous matter emitting an agreeable odour when heated; an extractive matter which blackens in the air; citric acid; citrates and phosphates of potash and lime.

The fibrous matter of potatoes is not of the same species as that of woody roots, but consists of a substance analogous to starch, which swells in water, becomes transparent, dissolves for the most part in dilute sulphuric acid, and affords gum and sugar, only by the action of concentrated sulphuric acid. In some of Einhof's experiments, the gummy matter which remained after evaporating the potato juice was saccharine, but he ascribed the formation of this sugar to an alteration produced on a portion of the gum in the course of analysis. Neither he, nor Lampadius, nor even Vauquelin, found sugar in sound potatoes. There can be no doubt, however, that from several causes, potatoes may become sweet-tasted, indicating that part of their starch is saccharified. Thus, by exposing them to repeated alternations of temperature, a few degrees below and above that of melting ice, the formation of sugar is so much promoted, that they grow soft with the production of a syrup of so rich a nature, that it will not permit the potatoes to solidify even when cooled several degrees below 32° Fahrenheit. This curious transmutation seems to depend, at least in its origin, upon a vital reaction; for when they are frozen very rapidly, no sugar is formed either during or after their thawing; but, on the contrary, potatoes so treated afford more starch than otherwise.

The nutritious quality of potatoes resides chiefly in the starch, fibrine, and albumen; the latter being essential to the formation of blood, Boussingault rates the feeding of a cow for twenty-four hours at fifteen kilogrammes (about thirty-three pounds avordupoise) of potatoes, and the quantity of azote in them at fifty grammes, or $\frac{1}{300}$th part of their weight. This would give $\frac{1}{75}$th part of azote in dried potatoes. Now, since these contain four times as much albumen as the moist ones do, we shall have four per cent. of albumen in them, according to the above analysis, which four parts contain the whole of the azote in 100 parts of dried potatoes, amounting to $\frac{1}{75}$th, or one and one-third per cent. But 100 parts of albumen, according to Dumas and Cahours, contain 15.75 of azote, and four will therefore contain only 0.63, being about one-half the proportion of azote assigned by Boussingault. Having, in the course of my frequently recurring analyses of guano, contrived a method of determining its proportion of azote, even to $\frac{1}{[illegible]}$th of a grain, or half a milligramme, I have recently had recourse to this method in the examination of potatoes. When a portion of these, in a dry, pulverulent state, was subjected to ignition in contact with hydrate of soda and lime, 0.579 of azote were obtained from 100 parts of the potato; a number which accords well with that deduced from Dumas and Cahours' results, as applied to the proportion of albumen in potatoes, an accordance which seems to justify my determination. Potato, in its ordinary moist state, will hence contain about 0.015 of azote, or one and a half parts in a thousand. To this element, and the animal principles into which it enters, the nutritive quality of potatoes is to be ascribed, while their starch and starchy fibrine afford the fuel of animal temperature.

In the diseased potatoes, a portion of the starch is transformed into sugar, and of the albumen into an acrid offensive brown substance. If such tubers as are characterized by brown spots in the interior, and a thickened brown skin, both composed of fungous fibres, be grated or sliced, and exposed to pressure, either alone or with a little tepid water, the juice obtained will be found to have a mawkish sweet taste, followed by a sense of pungency on the tip of the tongue. If some of this juice be mixed with a little of Trommer's grape-sugar test (an alkalized solution of sulphate of copper) this blue-coloured mixture will change into a bright orange hue, slowly, in the cold, but rapidly on the application of a gentle heat, with a deposit of protoxide of copper. By means of a modification of that test, described by me in the *Pharmaceutical Journal* for July, 1842, I have ascertained the existence of about five per cent. of saccharine matter in diseased potatoes; yet by the same re-agent, which is sensible to $\frac{1}{100}$th of a grain of sugar, I could observe none of it in perfectly sound potato. After satisfying myself, in this way, as to the presence of sugar in diseased potatoes, I proceeded to verify the fact by placing their expressed juice, as also their infusion, in contact with a little yeast, at a fermenting heat of from 80° to 90° Fahrenheit, and watched the resulting phenomena. A fermentative action soon began, and in an hour or two became so brisk as to throw up a thick, creamy froth, like that occurring with small-beer wort. At the end of thirty-six hours, the liquor having considerably diminished in specific gravity, was subjected to distillation, and yielded alcohol equivalent to about four per cent. of sugar in the potato. In order to obviate any chance of fallacy in these results, I requested Mr. Scanlan to repeat my fermentation experiments on a somewhat larger scale than mine, with diseased potatoes found in his own neighbourhood, at the extremity of London, opposite to my residence. He has accordingly made several similar researches, with like results, of which I shall give the particulars of one only. Two and a half pounds of the expressed juice of such potatoes as are now used solely for feeding cattle, corresponding to three and one-third pounds of the entire tubers, were mixed with a small portion of yeast, and set to ferment in half-filled bottles. The action soon became so vigorous that the barm rose to the brim of the bottles. At the end of thirty-six hours the liquor having become nearly tranquil, was distilled, and afforded 5000 water-grain measures of an alcoholic liquid, of specific gravity of 0.988, containing, by Tralle's table, eight per cent. of absolute alcohol, equivalent to sixteen of sugar. $16 \times 50 = 800$ grains, may be regarded as the quantity of sugar indicated by this experiment in three and a half pounds of the diseased potatoes, or in 23333 grains, being nearly three and a half per cent. In other samples I found, as above stated, results indicating considerably more sugar, the proportion being very variable, according to the state of the disease. The vinous spirit produced is by no means disagreeable in taste or flavour, and may be easily rectified into excellent alcohol, fit for every purpose of arts, manufactures, and pharmacy. Were it not for the oppressive laws of the Excise, sufficient alcohol might thus be obtained this season for the uses of a temperate people, reserving an equivalent portion of grain from the whisky manufacture for their sustenance. The residual cake of the diseased potato is well adapted for feeding cattle, the morbid juices having been separated, and it may be so dried as to keep unchanged for a moderate length of time.

In all the diseased potatoes which I have examined with the microscope, the fibres of a fungus called *botrytis*, from its grape-like form,—or of one called *uredo tuberosum*, may be observed ramifying round the cells which enclose the starchy corpuscles. Now these plants, however minute, are not self-generated, but must be produced by some seminal impregnation transported by the atmosphere, and peculiarly adapted to fructify upon the *solanum tuberosum.* I would hence conclude, that the potato disease is a peculiar vegeto-pestilence, diffused generally through the atmosphere, whose ravages have been favoured by the sunless humidity of the last season as the predisposing, but not as the exciting, cause. The proximate cause again, in medical language, or the essence of the morbid state, is the fungous inmate of the tuber, from seminal impregnation of the stem, which so paralyzes the vitality of the plant, that a portion of the starch and albumen becomes decomposed. This vegetable distemper, like that of the cholera, while general in its diffusion, is determined to particular localities and plants by certain predisposing causes; yet it is independent of these, having occurred in many regions where such causes did not materially operate. Whether it will recur, no human being can predict; meanwhile, it reads a great and solemn lesson to the rulers of states, never better expressed than in Virgil's well-known verse—

"Discite justitiam moniti, et non temnere divos;"

which may be translated, "Beware of obstructing the free supply of food to your people."

Many preposterous prescriptions have been obtruded on the public eye as to the best method of preserving the diseased potatoes from putrefaction. The above researches show the existence of a highly fermentable saccharine and albuminous matter in them, which becomes rapidly operative by contact with air and moisture. Care should therefore be taken to keep their skins entire, so as to exclude the atmospheric oxygen and humidity. It is well known that the sugar in ripe grapes undergoes no change while the skin is entire, but the moment this is pricked, the grapes begin to ferment, and speedily spoil. No plan is therefore more to be deprecated than that of slicing and mashing potatoes. They should be placed in an atmosphere kept by chemical means in a state of extreme dryness, which may be easily and cheaply effected by piling them upon a bed of brushwood, dry turf, or straw, interspersing through the pile unslaked lime coarsely bruised, and covering the pile thoroughly at the sides and on the top from the external elements. Since unslaked lime absorbs greedily one-third of its weight of moisture, it will bring the air in the spaces between the tubers into a perfectly arid state—a condition in which no decomposition of the substance can possibly take place. On the same principle, highly-polished steel articles may be kept for any length of time without tarnishing in our humid climate, provided a basin with lumps of unslaked lime be enclosed in the case or chest containing them. Slaked lime, on the contrary, being saturated with water, has no power of desiccation; but acts only by its causticity in favouring the destruction of all vegetable and animal matter.

The notion broached by Dr. Playfair, at his late lecture to the Royal Agricultural Society, of the potato disease being a *dropsy*, is incompatible with the fact so easily verified, that sound and unsound potatoes dug from the same root or locality, contain "like proportion of water."—*Lancet.*

Charlotte-street, Bedford-square, Dec. 9*th*, 1845.

ON THE MAGNETIZATION OF LIGHT, AND THE ILLUMINATION OF MAGNETIC LINES OF FORCE.

BY PROFESSOR FARADAY.

THE following abstract of Mr. Faraday's paper on the above subject, recently read before the Royal Society, is taken from the *Athenæum* :—

" For a long time past the author had felt a strong persuasion derived from philosophical considerations, that among the several powers of nature which in their various forms of operation on matter, produce different classes of effects, there exists an intimate relation; that they are connected by a common origin, have a reciprocal dependence on one another, and are capable, under certain conditions, of being converted the one into the other. Already have electricity and magnetism afforded evidence of this mutual convertibility, and in extending his views to a wider sphere, the author became convinced that these powers must have relations with light also. Until lately, his endeavours to detect these relations were unsuccessful, but at length, on instituting a more searching interrogation of nature, he arrived at the discovery recorded in the present paper, namely, that a ray of light may be electrified and magnetized, and that lines of magnetic force may be rendered luminous. The fundamental experiment revealing this new important fact, which establishes a link of connexion between two great departments of nature, is the following:—A ray of light issuing from an Argand lamp, is first polarized in the horizontal plane by reflexion from a glass mirror, and then made to pass for a certain space, through glass composed of silicated borate of lead, on its emergence from which it is viewed through a Nichol's eye-piece, capable of revolving on a horizontal axis, so as to interrupt the ray, or allow it to be transmitted alternately in the different phases of its revolution. The glass through which the ray passes, and which the author terms the dimagnetic, is placed between the two poles of a powerful electro-magnet, arranged in such a position as that the line of magnetic force resulting from their combined action shall coincide with, or differ but little from, the course of the ray in its passage through the glass. It was then found that if the eye-piece had been so turned as to render the ray invisible to the observer looking through the eye-piece before the electric current had been established, it becomes visible whenever, by the completion of the circuit the magnetic force is in operation, but instantly becomes again invisible on the cessation of that force by the interruption of the circuit. Further investigation showed that the magnetic action caused the plane of polarization of the polarized ray to rotate, for the ray was again rendered visible by turning the eye-piece to a certain extent, and that the direction of the rotation impressed upon the ray, when the magnetic influence was issuing from the south pole and proceeding in the same direction as the polarized ray, was right-handed, or similar to that of the motion of the hands of a watch, as estimated by an observer at the eye-piece. The direction in which the rotation takes place, will, of course, be reversed by reversing either the course of the ray, or the poles of the magnet. Hence it follows that the polarized ray is made to rotate in the same direction, as the currents of positive electricity are circulating both in the helices composing the electro-magnet, and also as the hypothetical currents, which, according to Ampère's theory, circulate in the substance of a steel magnet. The rotatory action was found to be always directly proportional to the intensity of the magnetic force, but not to that of the electric current; and also to be proportional to the length of that portion of the ray which receives the influence. The interposition of substances which occasion no disturbance of the magnetic forces, produced no change in these effects. Magnets consisting only of electric helices acted with less power than when armed with iron, and in which magnetic action was consequently more strongly developed. The author pursues the inquiry by varying, in a great number of ways, the circumstances in which this newly-discovered influence is exerted, and finds that the modifications thus introduced in the results are all explicable by reference to the general law above stated. Thus the effect is produced, though in a less degree, when the polarized ray is subjected to the action of an ordinary magnet, instead of one that derives its power from a voltaic current, and it is also weaker when a single pole only is employed. It is, on the other hand, increased by the addition of a hollow cylinder of iron placed within the helix, the polarised ray traversing its axis being then acted upon with great energy. Helices act with equal power in any part of the cylindric space which they enclose. The heavy glass used in these experiments was found to possess in itself no specific magneto-inductive action. Different media differ extremely in the degree in which they are capable of exerting the rotatory power over a polarized ray of light. It is a power which has no apparent relation to the other physical properties, whether chemical or mechanical, of these bodies; yet, however it may differ in its degree, it is always the same in kind; the rotation it effects is invariably in one direction, dependent, however, on the direction of the ray and of the magnetic force. In this respect it differs essentially from the rotatory power naturally possessed by many bodies, such as quartz, sugar, oil of turpentine, &c., which exhibit the phenomena of circular polarization, for in some of these the rotation takes place to the right, and in others to the left. When, therefore, such substances are employed as dimagnetics, the natural and the superinduced powers tend to produce either the same or opposite rotations, and the resulting effects are modified according as they are cumulative in the former case, and differential in the latter. In the concluding section of the paper, the author enters into general considerations on the nature of the newly-discovered power of electricity and magnetism over light, and remarks that all these powers possess in common a duality of character which constitutes them a peculiar class, and affords an opening which before was wanting for the appliance of these powers to the investigation of this and other radiant agencies. The phenomena thus brought to light confirm the views entertained by the author relative to the constitution of matter as being spheres of power, for the operation of which the conception of a solid nucleus is not necessary, and leads to the presumption that the influence of magnetism on bodies which exhibit no magnetic properties, consists in producing in them a state of electric tension tending to a current, while on iron, nickel, and other bodies susceptible of magnetism, currents are actually established by the same influence."

The author states that he is still engaged in the prosecution of these inquiries.

REVIEW.

ELEMENTS OF MATERIA MEDICA AND THERAPEUTICS. *By* EDWARD BALLARD, M.D., *and* ALFRED BARING GARROD, M.D. *Taylor and Walton, Upper Gower Street.* *8vo. pp.* 447.

THE want of a concise work on Materia Medica, embracing only such matter as strictly relates to this branch of knowledge, and is of most practical importance to the Pharmaceutist, has long been felt; and inquiries for such a work are not unfrequently addressed to us by correspondents. The volume before us is designed to supply this deficiency. The authors say, they

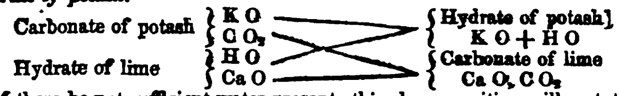
"Desire that it should be looked upon as strictly elementary; and, in so far as the description of the drugs is concerned, nothing more than a compilation. The necessity for this outline has been pressed upon them for some time by students with whom they are respectively connected, as well as by gentlemen in considerable practice, both of whom felt the inconvenience of reading through extended treatises, with a view to those essential points of instruction which might be conveyed in fewer words, and be less encumbered with extrinsic matter. Without depreciating, then, the larger works in our language as books of reference, the present is intended to be one every word of which the student ought to read, and with whose entire contents he should render himself familiar."

The first part of the work consists of a "Therapeutical Introduction," in which the *modus operandi* of medicines is described. This is followed by a "Chemical Introduction," the object of which is stated to be "to give a concise statement of the principles of the organic branch of the science (of Chemistry), and to furnish a connected view of the composition and leading properties of the compounds contained in the vegetable department of the Materia Medica." Then comes the "Inorganic Materia Medica," and the "Organic Materia Medica" under the separate heads of "Vegetable" and "Animal." The vegetable Materia Medica is arranged according to the natural classification of the plants yielding the various substances treated of. To this part of the work is prefixed a description of the different natural orders, illustrated by drawings taken from Lindley's *School Botany*. Finally, there is an Appendix, containing a description of certain Therapeutical agents which are not officinal.

In its general design and extent, the book is certainly calculated to meet the requirement to which we have already alluded. We think, however, the purpose stated by the authors in their preface would have been more completely carried out, if the Chemical Introduction, and what may be called the Botanical Introduction, had been omitted. These articles, in the necessarily limited and imperfect form in which they are given, can be of little use to the student, without the concurring aid of more complete elementary treatises; and to such treatises we think it would have been better at once to refer for information on these somewhat extraneous subjects. We are, also, the more inclined to this opinion, as we find a deficiency of some other matter strictly in accordance with the avowed object of the work, and the omission of which greatly detracts from its value. As an illustration of what we now allude to, we may quote the following, which is given under the head of

"LIQUOR POTASSÆ.

"PREP. *Carbonate of potash* is dissolved in boiling distilled water, and *slaked lime* being added, the whole is shaken together in a closed vessel till cold. The *carbonate of lime* is allowed to subside, and the clear *solution of potash* poured off and preserved in a green glass bottle. It is a better plan to boil the carbonate of potash and lime together. *Theory.*—Hydrate of lime and carbonate of potash brought together, form *carbonate of lime* and *hydrate of potash.*



If there be not sufficient water present, this decomposition will not take place."

In writing these instructions, the authors seem to have contemplated three objects:—First, to point out how the preparation called *liquor potassæ* is to be made; secondly, to explain the nature of the decomposition which occurs during the process; and, thirdly, to state the conditions essential to success in the operation. They have, however, failed in fulfilling two out of the three objects contemplated, in consequence of the *omission* of a most important point, namely the statement of *quantities.* The book is intended for the use, either of the practical man, who is engaged in making and using the substances treated of, or of the student, who requires both practical and theoretical instruction. To the former, it would be of little use to say that liquor potassæ is made by mixing together slaked lime, carbonate of potash and boiling water—he knows this already. To the student, it may, as far as it goes, be something gained; but he will necessarily be left, after reading the above article, in a state of much perplexity. In the first place, there is nothing to show, beyond a statement in the preface, "that those articles only which are rendered officinal by the London College are admitted into the body of the work," whether the formula above given is that of the London Pharmacopœia or not; and if it be, how much of it is taken from that authority. We are told, "it is a better plan to boil the carbonate of potash and lime together:" but the student will naturally ask, why? and, is this part of the instructions given in the London Pharmacopœia? Then, with regard to the theory, we are told, that "hydrate of lime and carbonate of potash brought together, form carbonate of lime and hydrate of potash." This, if true, is clear and explicit; but it is presently followed by a statement that, "if there be not sufficient water present, this decomposition will not take place." How much water *is sufficient,* does not appear.

This omission of the statement of quantities, occurs in nearly every formula throughout the book, whether officinal or otherwise, and although it is true that, in many cases, the omission does not so materially detract from the value of the remaining portion of the matter, as in the case above alluded to, yet we think it a defect which the authors would do well to rectify in a subsequent edition.

TO CORRESPONDENTS.

Several Correspondents have sent us copies of an abusive article, in a newspaper called the *Britannia*, reflecting very unjustly on Chemists and Druggists, and have called upon us to answer it. [We have read the article, which is the best illustration we have seen of the *argumentum ad absurdum*. It appears to us neither to deserve or require an answer, and the only speculation we are at all disposed to entertain on the subject, is, as to the length of the ears of the author.]

Mr. Belling, in reference to a recent question from a Correspondent, suggests the use of chloride of lime for bleaching oil of almonds, linseed, &c. [This plan may answer in some cases, and has been frequently adopted; but it is in some respects objectionable, especially when the oil is required for mixing with vegetable colours.]

A. S. P.—The instructions in the Pharmacopœia for making Syrup of Ginger are so clear, that we can add nothing to make them more intelligible.

J. P. W.—(1). The only hydrocyanic acid recognized in the London Pharmacopœia, is the acidum hydrocyanicum dilutum, which should be used in all cases in dispensing, unless acid of any other strength is specified.—(2). We understand the term extractum aloes to apply to the extract or inspissated juice of the aloe, as imported. Ext. aloes. purificatum or aquosum, denotes the purified extract ordered in the Pharmacopœia.

G. A.—Concentrated Essence of Ginger is easily made by percolation of any strength that may be desired. It may be made so strong as to contain the active matter of its own weight of ginger.

"A Perfumer" should consult some person in his own trade.

"Quid pro quo."—(1). We are not acquainted with Green's medicated soap.—(2). Apply to a "perfumer."—(3). Sandal wood oil is obtained by distillation from the wood.

"A Member."—(1). The letters Ph. D., denote Doctor of Physical Sciences, a degree which is granted at Giessen and other universities.—(2). When diluted acetic acid is partially congealed, the portion which remains fluid is the strongest.—(3). We cannot recommend a method of preparing concentrated infusions.

"Quina."—Syrupus Quinæ Dikinatis, see vol. iv., page 164.

A. P. S. (Kensington).—Ung. Anthracokali, vol. iv., p. 147.

"Amicus."—See the Pharmacopœia, oxide of mercury.

"Chondrine."—(1). There are two kinds of gelatine obtained from animal substances, one called *collin*, which is not precipitated from its aqueous solution by acetic acid; the other called *chondrine*, which is precipitated by acetic acid. The first is obtained from the skins and bones of animals, the second from the permanent cartilages.—(2). Nitric acid of sp. gr. 1.23 contains 40 per cent. of the strong acid of sp. gr. 1.50, according to Dr. Ure's table.

J. C.—See vol. iii., p. 190.

"Σωηπl."—Sp. æther. nitrici is often acid, in which case it would decompose iodide of potassium and set free iodine.—(2). We do not understand the question.—(3 and 4). These questions have been repeatedly answered.

We regret that want of space obliges us to defer an interesting article by Dr. Letheby, on a case of Poisoning by Nitrate of Potash, as well as several other articles.

Communications have been received from Mr. Butler, "An Associate from the Beginning," B. M. P. S., W. F. F., and "Petitor," which will receive our consideration.

Advertisements to Mr. Churchill, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. Smith, 17, Bloomsbury Square, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. VIII.—FEBRUARY 1st, 1846.

WITHDRAWAL OF THE MEDICAL BILL: NECESSITY OF A BILL TO REGULATE PHARMACY.

In our last number we made no allusion to Medical Reform, because the unsettled state of the Ministry involved the question in so much uncertainty, that it was impossible to predict what might be the result of the proposed changes in the Cabinet. It appeared at that time not improbable that the duty of bringing in a Medical Bill would be transferred to a new minister, in which case we might have expected, as a matter of course, an entirely new Bill; but we did not feel justified in founding any argument or observations on this supposition, being prepared for the possibility of a different result.

We are now enabled to inform our readers that Sir James Graham has withdrawn the Bill, and does not intend to proceed with the subject during the present session. Whether he will resume it at a future time or not, is, we believe, rather doubtful, and it must be admitted that the reception the late Bills have met with has been calculated to discourage him from embarking again in so intricate and difficult an undertaking.

We have heard it stated, that one reason for postponing the Bill is the agitation and excitement which prevail between the several parties concerned, as it is thought that in the course of a year or two, these symptoms may subside, and an amicable arrangement would in that case be more easily effected. At all events we may consider the question of Medical Reform in a dormant state, and not likely to make much progress at present.

Under these circumstances the inquiry naturally arises, are the Chemists to wait until the Medical Profession has settled its differences? and if the merits of the case be fairly considered we think there can be but one opinion on the subject.

The whole Medical Profession is interested in the establishment of proper legislation in reference to Pharmacy—the safety of the public demands it: the Chemists have been for some years striving to attain this object, and they are entitled to claim support in the endeavour.

The passing of a Bill for the regulation of Pharmacy would not obstruct or retard the progress of the Medical Bill. On the contrary, it would greatly facilitate the accomplishment of the latter undertaking, by removing one of the sources of opposition. The Chemists are not at all disposed to act on the offensive, but are always on the alert and ready to defend themselves whenever any interference with them is contemplated by the medical bodies. Alleged abuses, and incompetence among the Chemists, being the usual pretext for such interference, the removal of the cause would diminish the chance of opposition, and would, at the same time, be advantageous to all parties.

The substance of the enactment required for this purpose may be comprised in a few words. It is simply a Bill to oblige all those who assume the rank of Pharmaceutical Chemists, and dispense the prescriptions of medical men, to qualify themselves and pass an examination. This is the object we have in view, and in order to carry it into effect, we desire to be constituted by Act of Parliament a governing body on representative principles, having power to enforce the provisions of the Act. The general principles of this measure cannot, with any pretence of justice, meet with opposition. It is a hardship to medical men that it was not introduced long ago. The Physician and the Surgeon are obliged by law to undergo a complete education for the public benefit, in order to be enabled to prescribe the remedies suited to the complaints of their patients. Their credit is at stake in the effect of these remedies; yet the law, having taken every precaution to ensure the efficacy of the prescription, leaves the compounding of it to chance, and allows any person, however ignorant and destitute of the means of dispensing medicine, the full privilege of assuming the office of a Chemist, and placing in jeopardy not only the reputation of the Physician, but also the life of the patient. If education be requisite in the medical man, it is equally requisite in the Chemist, and we cannot imagine a more glaring inconsistency than the present state of the law in this respect.

Having stated the public grounds on which a reform is demanded, we may be allowed to advert to the claims of the Chemists themselves to that legislative protection which is desired. Our body, which was originally called into existence by the wants of the public, comprises in its ranks a large number of men who have used all the means in their power to qualify themselves for their responsible duties, and who are sincerely desirous of contributing to the usefulness and maintaining the respectability of their branch of the profession. But it also comprises others who having taken advantage of the defective state of the law, have commenced business without possessing any qualification whatever, and who uniting Pharmacy with the sale of all kinds of miscellaneous articles, and having no community of sentiment with the regular Chemist and Druggist, bring discredit on the whole body. The irregularities existing among some individuals are brought forward as an argument against the Chemists in general; and those who are endeavouring to put an end to these evils, obtain but little sympathy or assistance, because they are stigmatized as belonging to a body in which such evils exist.

For several years we have been pulling against the stream, and striving to introduce a system of education and other regulations, calculated to raise the character of our body, and to place Pharmacy in its proper position. The number of those who are thus engaged is sufficient to entitle us to some consideration, and the importance of the object in view ought to obtain for us such assistance as the undertaking deserves. The time has arrived when we must make a vigorous effort to complete the task which we have undertaken, and in which we have made some progress.

We feel persuaded that it is only necessary to place before the view of our brethren the real state of the case, in order to obtain the support of our whole body; and we feel so impressed with the justice and public importance of the cause in which we are engaged, that with this support we are sanguine in our anticipations of success. But nothing can be done without individual exertion: one unanimous effort must be made, and the prospect of success should be an additional stimulus.

It is satisfactory to observe the improvement in the tone adopted by the medical profession, when alluding to our body, in relation to the question of Medical Reform. As an example, we may quote an extract from the recent address of the Shropshire and North Wales Medical and Surgical Association to the members at large, in which a very fair and friendly disposition towards Chemists and Druggists is manifested. While the Committee advocate the establishment of restrictions in medical practice by unqualified persons, they recognise the claims of the Chemists to corresponding protection, as a compensation for any advantage which they might lose by such an enactment. A few years ago, Medical reformers were in the habit of urging the most stringent restrictions against Chemists and Druggists, without offering anything in the form of an equivalent.

"On the all-important subject of legislative protection to the profession, your Committee are of opinion that the Fellows and Members of the Royal College of Surgeons, and all other legally qualified practitioners, should have the right of recovering their reasonable charges for their respective services; and that all unlicensed practitioners, whether Chemists, Druggists, or others, should be restrained from attending patients, or performing any surgical operations whatever; but in justice to this deserving class of men, who are setting so good an example in their endeavours to advance their status, your Committee think it but right that every semblance of trade should be done away with in the medical profession, and that the keeping of retail drug shops by medical men (a practice so common in London, and so degradng to the profession), should be especially prohibited. Your Committee consider that a summary proceeding before the local magistrates would afford the best protection against illegal practice."

In most countries in Europe, and in some parts of Great Britain, the separation of Medical Practice from the sale of drugs has been adopted, and is admitted to be an advantage to the profession as well as to the public. This principle[*] was acknowledged in Portugal as early as the year 1641, although the profession in that nation is in other respects much less advanced than it is in our own.

If medical men would consent to discontinue shopkeeping, and to give up the dispensing of prescriptions as far as this is practicable, they might reasonably expect the Chemists to submit to some sort of restraint in giving advice, and both parties would derive benefit from this mutual concession.

We attribute most of the abuses, which up to the present time have occasioned the necessity for Reform, to the fact that the division of labour has not been properly recognised by our legislature; and so long as Pharmacy occupies a false position, it will continue to be a bone of contention between two rival parties, whose interests would not in any degree clash if a judicious and amicable arrangement could be effected between them. An opportunity now exists for bringing about such an arrangement, the desire for which has been for some years gaining ground.

Dr. Forbes, in the last number of the *Medical Review*, among the improvements which he enumerates, as being desirable in the medical profession, includes the

> "endeavour to abolish the system of Medical Practitioners being paid by the amount of medicine sent in to their patients; and even the practice of keeping and preparing medicines in their own houses.
>
> "Were a proper system introduced for securing a good education to Chemists and Druggists, and for examining and licensing them—all of easy adoption—there could be no necessity for continuing even the latter practice; while the former is one so degrading to the medical character, and so frightfully injurious to medicine in a thousand ways, that it ought to be abolished forthwith, utterly, and for ever."

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[*] See page 342 of this number.

HISTORICAL SUMMARY OF PORTUGUESE PHARMACY,

FROM THE FOUNDATION OF THE MONARCHY TO THE PRESENT TIME (1845).

FROM the foundation of the monarchy to the year 1449, a period of 310 years, there is no act of the legislature that makes mention of Pharmacy in this country. It is, however, to be presumed that, as diseases must have existed, the profession was followed with more or less method, and consequently with greater or less scientific knowledge. It is assumed that the practice at this time was that of the Arabs, the people whom the Portuguese first conquered. Their Pharmacy must have been that of Galen; and the probability of this is greatly strengthened by the circumstance of the King, Alfonzo V., decreeing the charter of privileges to the Apothecary Ananias, on his arrival from Ceuta at the king's request; and extending them to those who accompanied him, to establish themselves in the country—a sufficient proof either that there was neither Pharmacy nor Portuguese Apothecaries, properly so called; or that, if there were any, they were insufficient.

Subsequently to this period (probably from the kind intentions of the monarch in favour of science and of the health of his people) there appeared, on the 9th of March, 1456, a decree relating to drugs, and other articles in the shops of druggists and others, and imposing fines on those who sold them in an adulterated or deteriorated state. On the 23d of April, 1461, another decree of the same monarch appeared, with regulations for Physicians and Surgeons, prohibiting them from preparing medicines in their own houses to the injury of the Apothecaries, and with provisions with regard to Apothecaries, prohibiting them the practice of Medicine and Surgery.

It was on the 25th of February, 1521, that the King Don Manoel issued the decree for regulating the office of Chief Physician of the kingdom thereby created; providing also with regard to foreign Physicians, who were prohibited practising in the country without first qualifying themselves therein; and regulating with regard to these qualifications, prohibiting them at the same time taking fees from the sick. It also contains provisions respecting Apothecaries; prohibits them opening any (Apothecaries) shops without having been examined; and regulates such examinations. Finally, it regulates with regard to visits of inspection and the prices of medicines. All the monarchs after the King Don Manoel, until the occupation by the Philips, and even in the time of the first of these, in 1591, gave their attention, more or less, to this profession, decreeing regulations and establishing stipends from the revenues of the "Concelhos" to such Apothecaries as established themselves in any township; investing them and their profession more and more with various privileges and exemptions as may be seen in the decrees themselves, which from names and dates may be placed as follows:

Don Joàn III, on 29th October, 1535; ditto, on 20th August, 1544; ditto, on 5th July, 1554; ditto, on 3d August of same year; ditto, on 25th June, 1557. Don Sebastian, on 11th November, 1559; ditto, on 16th April, 1561; ditto, on 7th July, same year; ditto, on 16th March, 1563; ditto, on 19th June, 1563; ditto, on 15th March, 1564; ditto, on 27th January, 1565; ditto, on 15th October, 1575; ditto, on 9th November, 1575; ditto, on 11th October, 1576; ditto, on 10th January, 1578; ditto, on 15th May, 1578; ditto, on 7th June, 1579; ditto, on 1st June, 1581. Don Philip I, on 2d September, 1581; ditto, 14th January, 1582; ditto, on 18th February, 1583; ditto, on 7th December, 1583; ditto, on 28th May, 1584; ditto, on 5th September, 1584; ditto, on 5th October, 1585; ditto, on 20th December, 1585; ditto, on 18th of March, 1588; ditto, on 1st February, 1590; ditto, on 2d May, 1590; ditto, on 22d May, 1590; ditto, on 8th April, 1591; ditto, on 2d August, 1591.

From the occupation of the Philips to the 28th August, 1772, when King Dom Jose I. decreed the reform of the University of Coimbra, there had been no legislation that we are aware of with regard to this profession. In this reform Pharmacy was considered one of the branches of Medicine, and as such was included in its preparatory studies. A Professor's chair of this science was also instituted, which exists with more or less restriction even to this day. Hence originated Apothecaries duly qualified both in the theoretical and practical knowledge of this science, as well as of Chemistry; and which they were obliged to study before admission to the Pharmaceutical Dispensary of the University. [For more ample information refer to the Statutes of the University of Coimbra, part I., book 4, cap. 2.]

On the 7th January, 1794, was published the first legal Pharmacopœia, styled the *Pharmacopeia Geral*, from which the principles of Pharmacy were to be learned, both by those who devoted themselves to this science in the University (as also to Medicine), and by those out of it, that is to say, in private shops, and by those were they examined. From this period to 1835, when was published the *Codigo Pharmaceutico Lusitano* (decreed the legal Pharmacopœia), the former was the guide for students, until superseded by the latter, which even at present is the legal compendium and Pharmacopœia, and will continue to be such until the Faculty of Medicine of the University forms another; this commission having been assigned to it by the decree of 18th September, 1844. In 1836, the two Medico-Chirurgical Schools of Lisbon and Oporto having been reformed, chairs of Pharmacy and Materia Medica were established in them, thereby enlarging the study of this science, from that period, independent of the University. By this same law there was formed another order of Apothecaries, who are permitted to learn the theory and practice of this science in private shops, provided that, at the expiration of their pupilage, they be found on examination apt in their replies as regards Pharmacy, Chemistry, and Botany.

A circumstance, which without doubt must greatly influence the advance of this science, if such be the desire of her Majesty's Government, is the formation of an Association of Apothecaries, for the advancement of Pharmacy. It was founded on the 24th July, 1835. Among many representations, all tending to the enlargement of the science, addressed by this Association to the Legislative Chambers, as well as to her Majesty's Government, that one stands very conspicuous which asks for the establishment of especial chairs in Pharmacy, to be filled by Apothecaries properly so called, in the two Medico-Chirurgical schools previously mentioned.

Such is the state of Pharmacy in Portugal (October, 1845); and with regard to the writers on the subject, really national Apothecaries (not mentioning some Physicians who also wrote thereon), and who are not now living, they are as follows:—Thomé Pores, in 1512; Jose Homem de Andrade, in 1692; Manoel Gomes Leal, in 1700; Dr. Caetano de St. Antonio, in 1725; Antonio Lopez de Lima, in 1729; Dr. Antonio de Martyres, in 1735; Manoel Rodrigues Coelho, in 1735; Antonio Nogueira Cabral, in 1740; Antonio Martino Belleza, in 1763; Friar Ivào de Jesus Maria, in 1772; Dr. Caetano de St. Antonio, in 1763; Friar Christovahò dos Reis, in 1779; Francisco Raemondo Xavier da Costa, in 1794; Jose Francisco Leal, in 1794; Jose da Silva Pinheiro, in 1821; Caetano Joze de Carvalho, in 1833.

There are other writers, but as they are still living, we for that reason do not mention them. I also do not mention the legislative acts on Pharmacy from 1794 to 1841. These will be found in the second part of the Code of the Apothecaries, printed in this city of Oporto the same year.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

PHARMACEUTICAL MEETING,
JANUARY 14, 1846.

MR. MORSON, VICE-PRESIDENT, IN THE CHAIR.

A PAPER was read

ON THE MEDICAL PROPERTIES OF THE VARIOUS SPECIES OF CASSIA, FOUND IN THE WEST INDIES.

BY W. HAMILTON, M.B.

THE genus Cassia is particularly abundant in the West Indian islands, and presents itself in a vast diversity of forms, from the lowly herb to the more aspiring shrub, but almost all possessing properties which entitle them to the notice of the lover of medicine, no less than the votary of botany. Some of the more important and valuable of these, I propose to make the subjects of my present, and possibly, several consecutive papers.

It would be inconsistent with the purpose of a meeting, designed for objects purely pharmaceutical, to occupy its time with matters of merely botanical interest, but as the genus Cassia is so very extensive, and the species which merit consideration, are dispersed through such a multitude of divisions, it may not be amiss to premise a brief notice of the arrangement adopted in my manuscript Flora, in which I have chiefly followed that of the illustrious and lamented De Candolle. The 167 species which I have an account of, are disposed under eight sections, of which C. fistula, the first of De Candolle, I have, after the example of Persoon, from the totally distinct character of its fruit, transferred to Persoon's appropriate genus Cathartocarpus, which embraces eleven of the species which De Candolle has arranged under the head of Cassia, from which they differ most materially, in producing long, round, or compressed pods, internally divided into a number of cells, filled with a sweetish pulp, which is more or less cathartic, in which the seeds are imbedded. Without attempting any apology for this deviation from the system of so high an authority as that of the distinguished father of modern botany, I shall briefly notice the remaining divisions under which the remaining

156 species are distributed. These are, 1. Chamæfistula; 2. Herpetica; 3. Senna; 4. Chamæsenna; 5. Baseophyllum; 6. Absus; 7. Chamæcrista, and 8. species not sufficiently known. Of these divisions, the first, comprising thirteen species, presents none whose properties have attracted notice; and but one, the C. melanocarpa to which I find a West Indian habitat assigned. This section forms the connecting link between Cathartocarpus and Cassia, the fruit of all its species presenting legumes of a cylindrical form, internally divided, by transverse septa, into numerous cells filled with a pulp, more sparing in quantity, but whose medical properties do not appear yet to have been examined. It ought perhaps, like the eleven others which I have dissevered from Cassia, to be transferred as a subsection to Cathartocarpus, under which I may, at some future period, have occasion to notice it. This will reduce the species regarded as legitimate cassias to 143.

Commencing then, with De Candolle's third section, Herpetica, now become the first, we meet the Cassia alata, or ringworm bush, known in Nevis by the name of *French guava*, and in the French islands by that of *herbe à dartes*. This is a showy plant, with a subherbaceous stem, rising in rich soils to a height of from six to eight feet, and not unfrequently cultivated for its beauty in the neighbourhood of the planters' houses, where alone I have seen it. Lunan, however, informs us that it is to be met with in a wild state in the neighbourhood of the ferry, and in the upper parts of the sixteen-mile walk in Jamaica, where it seldom exceeds four feet. Popular opinion has ascribed to this plant antiherpetic properties, the reality of which I have never myself had an opportunity of testing, but which merit investigation. Doctor Hillary in his treatise on the diseases of Barbadoes, speaks of it as a never-failing remedy in these cases, and recommends friction of the parts affected with the expressed juice, or the application of a cataplasm of the young buds, flowers, and leaves, and in this recommendation he is supported by Browne and Dr. Wright.

The next division, Senna, contains but one, or at most two species, of whose medicinal properties we have any accounts upon which reliance can be placed; these are the Cassia obovata (C. Senna *Lunan Hort. Jam.*, ii., p. 167, and *Linn. Sp. Pl.*, i., p. 539-9) of De Candolle, and the C. Porturegalis of Bancroft, a new species, found in the vicinity of Port Royal, Jamaica, and first described by him as a distinct species, in a paper read before the Horticultural Society of Jamaica, in the year 1827.

According to Dr. Bancroft, the Cassia Porturegalis is the same with that described under the name of Cassia senna, in 1791, by Swartz, who then expressed his doubts about its correspondence with the senna of botanists, from which the senna of the shops was supposed to be obtained. By others, the Port Royal species was confounded with the Cassia obovata of De Candolle; these doubts, as Dr. Bancroft remarked, could not be satisfactorily cleared up, so long as it was uncertain from what species the senna of the shops was really obtained. By a careful examination of recent and dried specimens of the Port Royal plant, and a comparison with Swartz's description, Dr. Bancroft convinced himself of the identity of the two plants, and the correctness of the doubts expressed by Swartz.

From this examination also, Dr. Bancroft arrived at the conclusion that the senna of Port Royal did not correspond in its specific characters with one of the numerous species given by De Candolle in the second volume of his *Prodromus*, and least of all with his thirty-fourth species, Cassia obovata, with which it had been especially confounded.

I enter thus minutely into particulars which belong more strictly to a botanical than a pharmaceutical work, because I am led to apprehend that I have myself fallen into the same mistake with respect to a plant which I found growing wild along the beach at the bottom of Basseterre Bay, St. Kitts, to the eastward of the town, at the spot where the water of the pond finds a passage into the sea, where it flowered in March, and was supposed to have derived its origin from seed brought from Europe, and accidentally scattered there. Not at that time possessing any botanical work which might have aided my inquiries, and concluding perhaps somewhat hastily, that it was, as popular opinion represented it, an accidental introduction, and not a spontaneous production, I omitted to make any examination of its characters, and set it down in my notes as the Cassia senna of Linnæus (senna secunda Italica seu foliis obtusis, of Sloane) to which, at that time, the senna of commerce was commonly referred, and after my return to Europe, when I came to arrange my notes in a somewhat methodical form, I placed it, with De Candolle, under his Cassia obovata, to which I hastily, and probably erroneously, conceived it to belong. Having no longer an opportunity of procuring specimens of the St. Kitts plant for the purpose of comparison with the specific characters of Dr. Bancroft's Cassia Porturegalis, and being desirous of inducing some other person possessing opportunities superior to my own, to supply the deficiency, I shall here give the specific characters of the C. obovata from De Candolle, and those of Dr. Bancroft's from the abstract of his paper which he kindly sent me, omitting those parts of De Candolle's description, which are omitted in Dr. Bancroft's.

Cassia obovata, De Candolle —Leaflets 5, rarely 6-7 pair, obovate, obtuse, mucronulate with a setaceous mucro, venous. Petioles without a gland, stipules opposite at the base of the common petiole or rhachis, acuminated; racemes erect, terminal, many flowered; pedicels of the flowers very short; flowers deflexed, pale yellow; legume pedicelled, flat-compressed, arcuate, subcristate in the centre, tumid, about eight-seeded; seeds oblong, compressed.

Cassia Porturegalis. Dr. Bancroft.—Leaflets 3-5 pairs, rarely 6, oblong or obovate, mucronulate, unequal at the base, glaucous, the outer ones larger; minute awl-shaped stipules between each pair, and at the base of the petiole; stipules eared on one side, spreading, permanent; racemes axillary; legumes membranaceous, flat-compressed kidney-shaped, with a crest along each face.

From these descriptions, the striking differences of the two species cannot fail to strike the most careless observer. The presence of glands in the one, and their absence in the other; the presence of stipules between each pair, as well as at the base of the rhachis in the one, and their absence, except at the base of the rhachis in the other, with the difference in their form; the axillary racemes of the one, and the terminal racemes of the other, with the reniform legumes crested on each face of the one, and the arcuate legumes of the other, with an imperfect crest on one side only, are differences too obvious to be overlooked by the eye of a botanist. Whether the senna of the St. Kitts ponds corresponds with either, and which of these, or whether it differs from both, are points upon which I am unable to offer an opinion, and I can only express my deep regret at having allowed the opportunity to escape me. But whether identical or not, it is somewhat singular that both the Jamaica and the St. Kitts sennas should be found in such similar localities; and, if indigenous in those localities alone, localities which almost force a suspicion as to their exotic origin; being in both cases confined, as far as our present knowledge goes, to the immediate vicinity of the most frequented port in each island.

Lunan, in transcribing Swartz's description, which corresponds in many points closely with Dr. Bancroft's, says,

> "Swartz found it on the coast of this island, of which, however, *it is not a native*, although long ago introduced, and it is probable that Sloane's plant is only a variety. Swartz describes it as follows:—Stem shrubby, branched, even, with subdivided branches; leaves composed of five, seldom six pair of leaflets; common petioles alternate, round, thickened at the base; leaflets opposite, oblong, rounded at the tip, where there is a very short bristle, veined, glaucous, on very short petioles; stipules at the base of the common

petiole, opposite, acuminate; racemes erect, terminating, many flowered; the flowers on short peduncles, bent down, pale yellow; calycine leaflets lanceolate; petals convex patulous; three filaments superior, four middle smaller, three inferior; anthers of the superior filaments large, of the middle ones small, of the lower ones barren; germ lanceolate, style incurved, stigma acute; legume shaped like the stomach, pedicelled, winged on each side for each seed, the lower margin crenate; seeds eight, oblong, compressed.

Without stopping to examine the points of agreement or of difference between this last and the descriptions of Bancroft and De Candolle, I shall proceed to Dr. Bancroft's notice of its medicinal properties. We learn from the paper before me, that the earliest notice of the Jamaica Plant by a medical writer, is that communicated by Dr. William Wright to the *London Medical Journal*, and published in the 8th volume of that work: and Lunan acquaints us that Dr. Wright employed it as a cathartic. Dr. Bancroft states that,

"The late Dr. David Brown having ascertained the good effects of its leaves, had used it constantly for many years previous to his death, instead of the common senna, in the Artillery Hospital under his charge at Port Royal, and Dr. Miller, who succeeded him, had continued the practice with equal success. It had also been lately tried (in 1827), in the Kingston Public Hospital, and found to operate '*without causing pain, griping, or uneasiness*,' and several medical practitioners of this city (Kingston), had also employed it with similar results, two of whom had used no other senna for several years past. These,' continues Dr. Bancroft, 'were proofs of its being equally active with common senna; its taste is besides less disagreeable; and it seems, moreover, to possess the advantage of causing much less griping; as a proof of which it was mentioned, that mothers of families were in the habit of giving it to their children, even to infants, in the form of tea, with milk and sugar, and without any ginger or spice as a corrective. It had been supposed that it would not grow in any but the sands of Port Royal. A fine specimen, however, was produced that had grown in Kingston, which rendered it probable that it might be cultivated, in the low lands at least, of this island; and the ready sale which a mild yet active senna, such as this, was likely to meet with, in the markets of Europe, afforded encouragement towards attempting to raise it by cultivation here."

Thus far the extract from the Jamaica paper received from Dr. Bancroft. As far as memory, unaided by notes, allows me to speak, the properties of that found in St. Kitts did not differ materially from that of Jamaica. It also admitted of cultivation in other localities, and was not unfrequently to be met with in the gardens of the inhabitants, where it was kept, both for the beauty of its flowers and the utility of its leaves. And this fact inclines me more strongly to suspect its exotic character; but whether exotic or indigenous, it is much to be desired that the identity or the discrepance of the senna of the two islands should be botanically settled, and their value as objects of export for medical use determined.

In the next division, Chamæsenna, we meet the Cassia occidentalis; one of the most common weeds in the West Indies, and one which has perhaps the least to recommend it in its external appearance, or sensible qualities. This is the pois puant of the French, and the piss-a-bed, stinking-weed, and wild French guava of the English islands; but however unattractive in its form, its medicinal virtues fully compensate for its repulsive aspect, and entitle it to our regard.

Its recent root in decoction is powerfully diuretic, and has obtained for it, among the less refined inhabitants, the vulgar name applied among ourselves to the dandelion, and it is probable that it might be found to correspond with that plant likewise in its action upon the liver; and an extract similarly prepared would, no doubt, prove a valuable addition to our Materia Medica. The seeds, parched, and infused in boiling water, make a beverage resembling coffee in flavour, and possessing antispasmodic powers, which render it serviceable in attacks of spasmodic asthma; and the expressed juice is successfully employed as a cooling application to hæmorrhoidal inflammation.

In gonorrhœa, and other syphilitic affections, a decoction of the roots, prepared by boiling a handful in three quarts of water, till one-third has been evaporated, taken as common drink when cold, has been strongly recommended; and a similar decoction of the leaves and roots is employed in cases of icterites and ascites. Externally it is employed as a lotion in psora and other cutaneous affections of man, and for the cure of mange in dogs and horses.

But, notwithstanding these powerful recommendations, and notwithstanding the profusion with which it is scattered over every part of the West Indies, little advantage is taken of the boon in our English islands, to convert it to any useful purpose, and it remains for some gifted and spirited experimentalist to determine the full value of its properties, and add its preparations to our colonial and domestic resources.

The Cassia emarginata is another species belonging to this division, the cathartic qualities of whose leaves have occasioned its substitution for the senna of the shops. It is an arborescent species, attaining a height of ten or twelve feet, frequent in dry coppices in the low lands on the south side of Jamaica, flowering in March and April, and ripening its seeds in August. The inhabitants call it tree senna.

The two next divisions furnish no species remarkable for their properties, but in that of Chamæcrista we meet with the Cassia chamæcrista, or cane plant, the decoction of whose roots is highly esteemed, as an antidote to the poison of fish, and also of vegetables.

14, *Octagon, Plymouth.*

Dr. A. T. Thomson said it was to be regretted that the valuable and interesting papers with which Dr. Hamilton had favoured the Society, were not accompanied by specimens, so that experiments might be made in this country on some of the new remedies described. He had no doubt that there were many of the vegetable productions of our colonies, hitherto unknown here, which, if fairly tried, would prove superior to many of those at present in use among us.

ON THE PRESENCE OF BUTYRIC ACID IN ROTTEN POTATOES.

BY MR. JOHN ROBINSON ROGERS.

The last number of the Pharmaceutical Journal contains a paper from Mr. Deane, "On the Recovery of Starch from rotten Potatoes." It appears that these potatoes were buried in the ground upwards of three years, about the depth of one or two feet. On digging over this spot a short time since, a white mass of starch was turned up, and beneath this lay a quantity of the flattened tubers, with their cortical portion entire; some of these being sent to Mr. Redwood by Mr. Deane, I was induced to make a few experiments upon them, of which the following are the results:—

By the aid of the microscope, I find the centre of these potatoes to consist wholly of entire starch, no traces of vegetable tissue being left. Immediately under the cortex, the fecula is also perfect; bundles of spiral vessels are here present, and in many instances the cellular tissue itself is unaltered, and the starch particles are still seen floating in the albuminous liquid within the cells. The whole tuber has a strong and most offensive odour, which is entirely removed by treating it with successive portions of water.

Upon introducing about half a pound of these potatoes into a retort with water and distilling, a liquid comes over which has a strong acid reaction; this was neutralized with potash, evaporated to dryness, the resulting salt decomposed with dilute sulphuric acid and distilled, when an oily acid liquid was obtained, which dissolves in water in all proportions, has the peculiar smell of rancid butter, and forms crystalline salts with lime, baryta, and potash. On distilling some of the acid with alcohol and oil of vitriol, I have obtained an ether possessing the peculiar pine-apple smell of butyric ether.* A saturated solution of the lime salt becomes solid on the application of heat, and returns again to the fluid state on cooling; which, according to

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* Specimens of the different preparations alluded to were on the table.

Dumas, is a property possessed in a striking manner by the butyrate of lime. In fact, the acid has all the physical and chemical characters of butyric acid.

The following changes, which the constituents of the potato are capable of undergoing, will account for the formation of this acid:—

M. Pelouze has shown that sugar, in contact with caseine and water, will, if kept for some time at a temperature of 90° Fahr., be converted into butyric acid, by a species of fermentation in which the caseine acts the part of a ferment. The proximate constituents of the healthy potato are water, starch, albumen, woody fibre, salts, free acid, &c. The conversion of the starch into sugar often takes place in this tuber from various circumstances; thus, in germination this change always occurs, and the remarkable tendency of the decaying potato to germinate has been well shown this season; frequent changes of temperature, and the presence of a free acid, also cause the formation of sugar. Professor Liebig states that the albumen of the potato may be converted into caseine, as was the case with those grown last year. Dr. Ure has also found caseine and sugar in all the decaying potatoes he has examined. Thus, then, we may have present, sugar (from various causes), caseine, and water, the three bodies necessary for the formation of butyric acid; and it is to the presence of this acid when formed that I ascribe the singular preservation not only of the starch, but also of portions of the cellular and vascular tissues found remaining in these potatoes. The preservative power exerted by carbonic acid upon humus presents a somewhat analogous instance, the further decay of the humus being stopped by its presence, but recommencing on its removal. Thus, in both cases, we have a decaying body yielding a product, which, when formed, tends to prevent the further change of the substance generating it. Liebig says, that the fatty acids, resins, and wax, do not putrefy; and that when formed, they will remain in the ground for a great length of time without undergoing any change;—amber is an example of this, and a further one is given by the butyric acid contained in these potatoes, which must have been in the earth a long time. On digesting a portion of the tubers in cold water, I have been unable to detect the presence of sugar by the application of Trommer's test, nor does iodine give evidence of the presence of dextrine.

It may be asked why there are no traces of dextrine or sugar present in these potatoes? as it is probable from what has just been stated, that the butyric acid when formed would prevent any further change of starch into dextrine, or dextrine into sugar, and thus preserve one or both of these bodies unchanged; but when we consider the situation in which these tubers were placed in the earth, with water continually filtering through them, the disappearance of these bodies, both of which are soluble in water, may be easily accounted for.

I believe that this is the first instance in which butyric acid has been obtained from rotten potatoes; but in the *Comptes Rendus* for November 10, 1845, there is an extract from a letter of Prince Louis Lucien Bonaparte, in which he states that he has procured both butyric and valerianic acid from wheat, damaged in the hold of a vessel by the action of sea water. Now, in the potatoes I have been experimenting upon, from the first I suspected the presence of valerianic acid, both from their odour, and from my having obtained, during the distillation of the butyric acid, a very minute oily globule which appeared floating on the surface, and which I in vain endeavoured to separate. I hope to be enabled to operate on larger quantities of these potatoes, as I still feel persuaded that this acid does exist in them.

If then, certainly butyric, and probably valerianic acid is to be obtained from rotten potatoes, may we not reasonably hope that the individuals who have this season sustained so severe a loss by the universal decay of their potatoes may, if they have buried them in the ground, one day find them rich in this valuable organic acid, as well as retaining the greater part of the starch unaltered.

Laboratory of the Pharmaceutical Society, 17, *Bloomsbury Square.*

The Chairman expressed the satisfaction which he, in common, he had no doubt, with the rest of the meeting, had felt on hearing the paper which had just been read, emanating, as it did, from a pupil in their own laboratory. It was gratifying to obtain these practical evidences of the benefits resulting from the means afforded by the Society for the education of pupils.

Dr. Thomson thought the results obtained by Mr. Rogers were exceedingly interesting, and might probably tend to throw some light on the subject of the so-called potato disease of last season. He would not admit that the decay which had occurred in the potato crops could properly be ascribed to disease; it was, he thought, rather the result of the peculiar conditions to which the potatoes had been exposed during a very unfavourable season. Having some ground attached to his house in the country, in which potatoes were grown last year, he had observed that in the early part of the season vegetation was very prolific and rapid; in the month of June it became languid and slow, and soon afterwards the plants were nearly all blighted. He had also observed that in his own ground, as well as in that of his neighbours, there had been scarcely any fruit formed on the potato plants. He was satisfied therefore that the first cause of the evil was the check which vegetation had sustained from the uncongenial nature of the weather. All the constituents of the tuber were deposited there from the sap which was previously elaborated in the herbaceous part of the plant, and any defect in vegetation would necessarily alter the character of these constituents.

ON SPIGELIA ANTHELMIA,[*]

OR DEMERARA PINK ROOT.

BY DR. BONYUN.

The indigenous species of pink root which is in great repute among the labourers of British Guiana, particularly those residing on the banks of the rivers, has not as yet, I believe, been sufficiently brought to the notice of medical men, nor its relation to the Spigelia Marylandica, or officinal pink root, determined. This herb, which grows in great abundance on the East and West coasts of Demerara, and on the banks of the rivers, is identical with that described by Patrick Brown, anno 1756, p. 156, in his *Civil and Natural History of Jamaica*, as Anthelmentia, or wormwood. He there says—

> "This vegetable has been long in use among the Negroes and Indians, who were the first acquainted with its virtues, and it takes its present denomination from its peculiar efficacy in destroying worms, which I dare affirm, from a great number of successful experiments, it does in so extraordinary a manner, that no other simple can be of equal efficacy in any other disease, as this is in those which proceed from these insects, especially when attended with fever or convulsions."

Griffith Hughes, in *The Natural History of Barbadoes*, 1750, p. 230, likewise mentions this plant as a powerful anthelmintic, under the name of Loggerhead Weed. Fusée Aublet, *Hist. des Plantes de la Guiane Française*, vol. i., p. 126, calls it, from Maregravius and Plumier (1703) Acapabaca, and gives the French name by which it is generally known through the French islands, La Brenvilliers, after the infamous Marquise de Brenvilliers, who, in conjunction with her lover St. Croix, poisoned so many people in France in the reign of Louis XIV. The *Icones Plantarum Medicinalium*, Nuremburg, 1799, gives a plate of Spigelia Anthelmentica, and Linnæus, *Species Plantarum*, anno 1762, tom. i., p. 213, describes the plant; but no mention is made in either of these works of the Maryland species. Pereira, *Elements of Materia Medica*, 1842, vol. ii., p. 1288, describes the Spigelia Anthelmentica as possessing medicinal qualities similar to the Maryland species, quoting from Browne and Nees von Esenbeck. *Handbuch der Medicinisk-Pharmaceutischen Botanik*, 1831, vol. ii., p. 654, gives a long description of both species, giving, however, a preference to the Maryland species, "*as being more used in North America.*"

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[*] Caule herbaceo ramoso, foliis oblongis utrinque attenuatis, summis quaternis, racemis spicatis, staminibus corolla brevioribus.—*Sprengel*, vol. i., p. 584.

I have been thus particular in giving an account of the history of our indigenous species, in consequence of being desirous to show that the Vermifuge Spigelia, first brought to the notice of Europeans, was the one indigenous to the islands and continent of South America, and not the Maryland species, which became known afterwards, and has since been substituted for our species. The first mention of Spigelia Marylandica, Pereira states, was in 1704, whilst the Spigelia Anthelmentica was noticed by Plumier, *Nova Plant. American.*, Gen. 11, in 1703, under the name of Arapabaca. The Spigelia Marylandica is collected, according to Thomson, Pereira, and others, by the Creek and Cherokee Indians, and sold to the American Merchants.

Pereira says, vol. ii., p. 1286,

> "Owing to the imperfect manner in which the plant is dried, it seldom happens that packages of it reach the market free from dirt and mouldiness."

With regard to the great efficacy of the plant, the testimony of Browne, a learned physician and excellent botanist above quoted, and the experience of the common people (by no means a despicable criterion) ought to be relied on. The late Mr. J. D. Paterson,* of Christianburg, a gentleman of remarkable powers of observation and strong intelligence, told me, shortly before his death, that he was in the habit of administering the Demerara pink root in decoction, in the proportion of from two to three fresh leaves for a dose, and that the effect was much more certain and marked than that produced by the pink root of the shops in thirty or forty grain doses. I have likewise lately been informed of several cases in which the decoction of the fresh leaves of our species was efficacious when the Maryland failed.

The preparation of the plant for sale is very simple. It is pulled up by the roots in a green state, and the seeds stripped off; it is then carefully cleaned, dried in the sun, and packed in bundles.

George Town, Demerara.

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* An extensive wood-cutter, residing at Plantation Christianburg, Demerara River.

Dr. Thomson inquired if any one present could state what kind of worm was alluded to in the paper.

Mr. Stutchbury, of Demerara, said the kind of worm for which the Spigelia was generally administered in Demerara, was commonly called the maw-worm (*Ascaris vermicularis*).

STATEMENT OF THE QUANTITIES OF MEDICINAL HERBS SUPPLIED TO THE PRINCIPAL DEALERS IN THE LONDON MARKET.

BY MR. SQUIRE.

	FROM MITCHAM.		From other places in the Vicinity of London.	TOTAL.
	Average of 3 years, 1840-41-42.	Average of 3 years, 1843-44-45.	Average of 3 years, 1843-44-45.	Average of 3 years, 1843-44-45.
Chamomile flowers ...	12 tons	4 tons	16 cwt.	4 tons 16 cwt.
Red-rose petals	5000 lbs.	2200 lbs.	—	2200 lbs.
Poppy capsules, whole	350,000	200,000	750,000	950,000
" " broken	4 tons	2 tons	2 tons	4 tons
Liquorice root	30 tons	12 tons	3 tons	15 tons
Angelica root	2 tons	5 cwt.	5 cwt.	10 cwt.
Henbane plant.........	6 tons	5 tons	15 tons	20 tons
Belladona plant	4 tons	2½ tons	3½ tons	6 tons
Stramonium............	16 cwt.	4 cwt.	18 cwt.	22 cwt.
Aconite..................	12 cwt.	7 cwt.	14 cwt.	21 cwt.
Savine	25 cwt.	25 cwt.	—	25 cwt.
Wormwood	10 cwt.	10 cwt.	1 ton	1½ ton
Rhubarb root	—	—	20 tons from Banbury	20 tons

The Chairman said, the statement which had just been read contained the result of an inquiry instituted at the suggestion of the Scientific Committee. It had been presented at the last meeting of the Committee, and they had directed that it should be published, although it contained only a part of the information expected ultimately to be obtained. It was hoped that, by the publication of this partial statement, individuals may be induced to furnish further information to Mr. Squire, which may enable him to complete his statement. The quantity of English rhubarb root brought to the London market, for medicinal use, would no doubt surprise many persons, and the question would very naturally be asked, what becomes of all this? He believed, from the information he had received, that the greater part of it was exported to the West Indies, and other foreign parts. He thought it very desirable to have some experiments made with the view of determining the comparative strength of the English and foreign rhubarbs.

ORIGINAL AND EXTRACTED ARTICLES.

CASE OF POISONING BY NITRATE OF POTASH.

BY H. LETHEBY, M.B.,
Lecturer on Chemistry at the London Hospital.

Maria Lamb, aged twenty-eight, a servant of rather delicate constitution, caught a cold early in November last, and was attacked with rheumatism in her head and face. To cure this she was recommended to take a mixture of gin and powdered nitre. Accordingly she purchased two ounces of the latter, and put it into a bottle with a quartern of gin, intending to take these quantities in three equal doses.

Upon the night of Monday, Nov. 10th, after a tolerably hearty supper, she took the first dose, about one-third of the mixture, and was careful to shake the bottle well so as to get a fair proportion of the undissolved salt. She did not experience any inconvenience that night, but slept as usual, and in the morning after getting up and dressing, took a second dose, when she was instantly attacked with a severe burning pain in her stomach, and in a few minutes vomited and fainted away. In this state, cold and bedewed with perspiration, she was conveyed to her bed, where she appeared at first to recover a little; but about ten o'clock she had got so much worse that a medical man was sent for. He did not arrive, however, until five in the afternoon, and then the vital powers were still greatly depressed, and the pain in the stomach unmitigated. He ordered an emetic of ipecacuanha, which made her very sick, and kept her retching all night, so that she did not get one moment of repose. In the morning she had become much worse, and was observed to be getting delirious; the agony of the stomach was still intolerable, her extremities cold but yet bathed with perspiration, and she was not able to pass any urine; altogether she seemed to be in such a precarious state that her mistress thought it would be better to send her home to her sister, who lived in the neighbourhood.

About six o'clock in the afternoon of this day (Wednesday), Mr. Wallace, of the Bow Road, was sent for, and he found her suffering under the most excruciating agony of the stomach; she was kept in bed with difficulty, and tossed herself about and raved like a mad woman. Notwithstanding all this, her extremities were deadly cold, her countenance pale and anxious, and the pulse scarcely perceptible. He immediately ordered warmth to be applied to the hands and feet, and a mustard poultice over the region of the stomach, directing also that she should partake of some warm milk and water. This, however, did not remain in her stomach, it was instantly rejected, together with a quantity of green slimy matter. He then prescribed a mucilaginous mixture, containing full doses of opium, which was retained, and soon gave her relief. Upon visiting her between ten and eleven o'clock of the same evening, he found that reaction had come on,—she was now hot and feverish,—the countenance was tinged with an erysipelatous flush, the pulse was ninety-six and full, and the pain in the stomach somewhat mitigated, though it was still considerable: he bled her to sixteen ounces, and applied a blister over the epigastric region. She slept a little during the night, and felt much better in the morning; he then found that she had not passed any water since Tuesday; but as there was no distension of the bladder, he did not interfere beyond ordering an enema, and the continuance of her mucilaginous mixture, with smaller doses of opium. The enema operated in the course of the day, and then she passed a small quantity of urine, but it was with some difficulty. The scarlet rash over the face and neck had also become more intense. On Friday she felt a little better, but still complained of the pain in her stomach and throat. On Saturday and Sunday she remained in nearly the same state, and had not partaken of anything but weak barley-water. On Monday she tried to eat a small quantity of toast, but it gave rise to great pain and vomiting. Fearing that there might be some serious mischief lingering about the stomach, Mr. Wallace thought it right to have a second opinion, and he requested me to see her with him. I found her covered with the rash before mentioned; the pulse and temperature of the body natural, but the bowels and bladder had not been relieved for many hours; there was still great pain in the stomach, and it extended along the course of the œsophagus. On examining the back of the throat, it was red and somewhat inflamed, and pressure increased the pain in the stomach. A blister was therefore again applied over the epigastric region, and an enema of castor-oil administered. This relieved her very much. On Tuesday she was better. On Wednesday the rash had left her, but the stomach was still irritable and painful, and she did not venture to take any solid food for a week after this. She is now convalescent, although she complains of coldness and occasional pains and cramps in her limbs.

The remaining third of the mixture was put into my hands for examination, and found to consist of a clear liquor, resting over a quantity of undissolved salt. The former measured ℥jss., and yielded, on evaporation, forty-nine grains of nitre. The undissolved portion was pure nitrate of potash, and weighed seven drachms, so that she could not have taken quite a third of the saltpetre at each dose.

Remarks.—Cases of poisoning by nitrate of potash are not very frequent, still their occasional occurrence is sufficient to indicate caution in the use of this salt. *Orfila* in his *Traité de Toxicologie* has recorded several experiments made upon dogs, which prove that it is a powerful irritant poison, and that it produces its effects even when applied to the abraded surface of the body; he has also reported some observations of its mortal action upon the human subject; these, together with the reports of other authors, I have arranged, somewhat after the manner of *Devergie* (*Médicine Légale*, vol. iii., p. 324), under the three following heads:—

1st. It has produced death in six recorded instances, namely, in the case of *Comparetti*, where one ounce and a half killed in six hours (*Orfila* vol. i., p. 283): that of *Souville*, where one ounce and a half killed in sixty hours (*Journ. Gen. de Med.*, lxxiii., p. 19); that of *Laflize*, where ℥j produced death in three hours (*ibid* lxxi., p. 401); that quoted by *Taylor* (*Casper's Wochenschrift*, xviii., 1841) where one ounce killed a man in thirty-six hours; that of *Gmelin*, where six drachms, with two of cream of tartar, killed a child in four hours (*Appar. Medic.*, t. i., p. 68); that of Dr. *Geoghegan*, where from ℥j to ℥jss, killed a man in two hours (*Taylor's Manual*, p. 130.)

2dly. In many cases it has produced very dangerous and almost fatal symptoms: thus in the case of Dr. *Alexander*, a handful caused bloody stools and imminent danger for three days (*Experimental Essays*, p. 109); that of Dr. *Falconer*, where ʒij produced bloody vomiting and other ill effects, which did not leave for six months (*Mem. Lond. Med. Soc.* iii., p. 527); that of Dr. *Butter*, where ʒij produced bloody vomiting and dysentery, which lasted seven days, and other symptoms remained for two months; two cases are also quoted by *Christison* (p. 241) where ℥j produced dangerous cerebral symptoms; and in this case, a little more than an ounce taken in two doses produced the most alarming effects.

3dly. Some other cases are recorded, in which little or no ill effects seem to have followed; thus *Christison* mentions a case (p. 239) where a gentleman took nearly ℥j by mistake, and retained it on his stomach for a quarter of an hour, and then the only ill consequence was vomiting. *Tourtelle* also speaks of ʒij having been taken without producing any sickness or other effects than moderate griping and great purging. Such cases as these have led many physicians to believe that nitre is not a worse poison than other saline purgatives, but it appears to me that the first set of cases are quite sufficient to remove this notion, while the others show that unless the salt is largely diluted, or sickness comes on, and with it the rejection of the poison, very dangerous symptoms manifest themselves. It is probable that the reason the first dose, in the case of Maria Lamb, did not produce any unpleasant effect, was, that the stomach derived protection from the meal which had been previously taken, or it might have been that the dose was not so large as the subsequent one.

With respect to the symptoms which were evidenced in this case, they appear to correspond very nearly with those recorded by other authors, and indicate that the action of the salt may be divided into three stages; first, that of *local irritation*, manifested by the burning pain, great sickness, the vomited matters being frequently bloody, and the subsequent purging. Secondly, and perhaps by reason of this violent action upon so important an organ as the stomach, it produces *a stage of collapse*, evidenced by the syncope, the paleness, the weak pulse, and general coldness of the surface. Then follow *other and constitutional symptoms;* as, for example, some chronic affection of the stomach or intestines, or a disorder of the skin or bladder, or nervous system. Indeed, nitrate of potash appears to exert a specific action over the cerebral organs, and it may be either manifested directly or at a later period. *Orfila* observed coma in his experiments on dogs, and in the cases of *Laflize*, of Dr. *Geiseler*, and another quoted by *Christison*, there were convulsions immediately after taking the salt, while in the latter case, there was palsy of two month's duration; and in the case of Dr. Butter's, there was a nervous effection resembling chorea, which also lasted for two months. Both these indicate a secondary or later affection of the nervous system. One of the peculiarities in the case of Maria Lamb, was, that the secretion of urine was entirely stopped for about thirty-two hours. Now, nitrate of potash, when given in small doses, is one of our most potent diuretics, and its operation here can only be explained by supposing that it had given rise to great congestion of the renal vessels, and in this way put a stop to their functions.

The *treatment* which is prominently indicated in these cases is fourfold; first, to get rid of the poison by means of an emetic, provided the stomach fails to do as much of itself, then to combat the collapse and the local symptoms, which are most urgent, by external warmth, mucilaginous and opiate drinks, with leeches or counter-irritation over the region of the stomach; thirdly, to adopt antiphlogistic measures when the reaction comes on; and, lastly, to treat the nervous or enteritic affections which may supervene by mild tonics and attention to diet.

10, *Tredegar Square, Dec.* 16*th*, 1845.

CASE OF POISONING BY STRYCHNIA.

"A. F——, aged thirteen, about half-past five P.M., swallowed in jest three pills, which belonged to a paralytic patient in the same ward. Each pill contained a quarter of a grain of strychnia. She had been occasionally in the habit of taking medicines belonging to other patients. Twenty minutes after taking the pills, she said she felt a strange sensation in her head, and became almost immediately convulsed. The arms were found extended and rigid, as also were all the muscles of her body, which was bent backwards at a considerable curve; pupils were natural; pulse was obscured from the rigidity of the muscles, but impulse of the heart was strong; face much flushed and lips livid; breathing rapid and difficult, but larynx free; spasms of diaphragm very marked. Every few minutes she had a fit of general convulsions. The mind was unaffected, and great fear and anxiety for relief were expressed.

"The cause of her illness being at first unknown, six ounces of blood were abstracted from the temporal artery. Cold lotions were applied to the head, and sinapisms to the extremities. Ten minutes after the symptoms began, the owner of the pills told the cause, when a scruple of sulphate of zinc was immediately given, and large draughts of warm water, which were eagerly swallowed by the patient. Vomiting, however, was not induced for about a quarter of an hour, and then sparingly. All this time the opisthotonos and universal muscular twitchings had continued violent; but now, during one of the ineffectual attempts to vomit, the rigidity of the muscles suddenly relaxed, and the spasmodic contractions ceased. The heart's impulse, previously strong, could not be felt, and respiration was for the time extinct. Her face, which, from the commencement of the attack, had continued deeply flushed, became gradually pale, from above downwards, her lips remaining livid. She was laid down, and seemed to recover slightly; her chest heaved slowly, and her heart beat feebly, and at long intervals. The flush also somewhat returned to the face, but with the exception of a few twitches, she had no recurrence of the spasms. The pupils were dilated, the eyes fixed, and turned upwards. The stomach-pump was suggested, and immediately applied, but without any good effect. In a short time the respiration again ceased, and the heart could no longer be felt. The flush, which had been but slight, again descended and disappeared on the neck. Artificial respiration and galvanism to the phrenic nerve were now tried in vain. The patient was dead. Death took place at three-quarters past six P.M., little more than an hour after the poison had been swallowed, and about three-quarters of an hour after it had produced its physiological effect."—*Edinburgh Monthly Journal.*

THE MODE OF PREPARING THE PATENT ORGANIC CAPSULES,

Patented by Messrs. Evans and Lescher.

At the time that we described the membrane capsules, which were exhibited at the *Conversazione* on the 12th of November, we were not in possession of a copy of the patent, from which we now make the following extract:—

"The invention consists of applying membrane to contain or envelope medicines, in doses suitable to be swallowed whilst contained in such envelopes. And in order that the invention may be most fully understood and readily carried into effect, we proceed to explain the means employed for preparing and using animal membrane when performing the invention. We would, however, first remark that medicines have been heretofore enveloped in gelatine, which, although it prevents the medicine being tasted when in the mouth, the covering too quickly dissolves; and persons having taken medicines so enveloped in gelatine, have soon after experienced nauseous eructations.

"The object, therefore, in using an organic substance, as the material for enveloping medicines, is to prevent the medicines which are taken therein from being too quickly released: the membrane resisting the humidity and heat of the stomach, and, in some degree, the digestive powers of the gastric juice, and thus the coverings of medicines so enveloped will not be digested till they arrive in the intestines, thereby avoiding those disagreeable sensations and nausea heretofore common when employing gelatine as the material for enveloping medicines.

"The coverings of membrane we call *capsules;* the organic substance preferred is derived from the small intestine of the sheep, or other herbivorous animals, and the process of preparing the same is similar to that employed by the makers of harp-strings, so far as regards getting it freed from the peritoneal mucous and external membranes. The membrane thus obtained, being thoroughly washed in pure water, is then cut into small lengths, suitable to be converted by being placed on small moulds into capsules, calculated to contain and envelope portions of medicine either fluid or solid. When the membrane is cut into pieces, as above described, it is desirable to immerse them in dilute sulphurous acid of the strength of one part acid and ten of water; this has the effect of preserving the membrane from putrefaction for an indefinite time.

"The capsules when dry and taken from the moulds are then filled with the medicine, and being closed and tied with fine thread, the surplusage is cut off, and the ends confined with a small portion of gum or gelatine."

In the above description one superiority of the membrane over the gelatine capsules is not noticed, we allude to the small space occupied by the material. The membrane is so thin as to constitute a very trifling addition to the quantity of substance to be swallowed, while nearly half the substance of the gelatine capsules consists of gelatine or glue. These latter capsules are now manufactured on so large a scale, and sold wholesale at so cheap a rate, that it can scarcely be supposed that the makers can gain any profit at all if they employ materials of the best quality. We know that in some cases glue of a common description is substituted for gelatine, and have seen capsules in which the copaiva was mixed with turpentine. This, of course, does not apply to the gelatine capsules made by respectable manufacturers.

As the membrane capsules can only be made by the patentees, who are responsible for the quality of the contents, they are not likely to vary in construction or efficacy, and this guarantee of uniformity is another advantage. It being desirable to ascertain from medical men whether the membrane possesses the superiority claimed for it in the patent, we subjoin an extract of a letter from Dr. Garrod* on the subject:—

"I have made an extensive trial of the organic capsules of copaiva, both in my public and private practice, and am prepared to state that they answer every purpose that could be desired. From their texture they are enabled to withstand the solvent power of the stomach for a time, sufficient to allow them to have passed so far as to produce neither nausea or eructations; yet the balsam becomes absorbed into the system, and therefore all the good effects of the medicine are obtained. I have given them with much benefit to ladies suffering from affections of the lower portion of the alimentary canal, when the ordinary mode of administering the medicine could not be resorted to, on account of the disturbance of the digestive organs which it produced.

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* Physician to the Fore Street Dispensary, and Lecturer on Materia Medica at the Aldersgate School of Medicine.

"I think that the organic membrane may also be applied with advantage for the purpose of enclosing other medicines—as cod liver oil, ox gall, croton oil, asafœtida, syrup of iodide of iron, &c. &c., when their power of resisting, for a time, the action of the digestive organs would be attended with beneficial results."

THE PHŒNIX.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—A late curious correspondent requested some information respecting the Phœnix, and desired to know why this unique bird should figure in a sign over the shop fronts, and on the cards of sundry Chemists and Druggists; as his question is yet unanswered, I send you the following:—

The Phœnix, we are told by Herodotus, was a noble bird, of the size of an eagle, with a plumage of crimson and gold. Cuvier, in his notes to an edition of Pliny's *Natural History*, considers that the description there given might well apply to the golden pheasant; it appeared in Egypt once in 500 or 1000 years, bringing with it the ashes of its father, enclosed in an egg formed of myrrh, to deposit there out of filial respect. At Heliopolis this bird is reported to have appeared in the reign of Ptolemy, followed by others of the feathered tribe attracted by its beauty, and was considered as a solitary and companionless wanderer during the period of its long life, at the expiration of which it constructed a nest of spices, deposited the germ of its successor, and perished by fire caused by solar heat.

The name Phœnix has also been applied to the palm-tree, which was considered as reproduced from the remains of the parent plant, and antiquarians would probably trace from the existing remains of Phœnician sculpture (on which the leaves of this tree are delineated), some connection with their ancient nature, and the fable in question.

One of our old writers states, that "surely they were not well-wishers unto parable physick, or remedies easily acquired, who derived medicine from the phœnix, which Pliny has justly condemned, considering it a folly to find out remedies only replaceable every thousand years." I imagine, however, that should the nest of the Phœnix become a popular remedy, the supply would soon equal the demand.

The priests of olden time did not suffer this fable to be useless to them, and set it forth as an emblem of the resurrection, and alchymists (writers who combine much apparent piety with their studies, and whose hopes of success rested, not unfrequently, on prayers and fasting), used it as a type of purification by fire, of absolute perfection. However, most probably, it is adopted by chemists as a sign, to indicate the purity of their preparations, and such use is of ancient date.

The well-known Mr. Godfrey used it, and was not unfrequently addressed as the phœnix chemist. *The Penny Cyclopædia* contains a very good article on this subject.

Yours very truly,

M. R. N. T.

DESCRIPTION OF TYLER'S SODA WATER MACHINE.

WITH A PLATE.

In compliance with the request of several correspondents, we give a description of a soda water machine, which is adapted for the preparation of ærated waters on a small scale, or for a more extensive manufacture, according to the size and completeness of the machine.

No. 1 complete, as represented in the engraving, is calculated for bottling 150 dozen per diem; No. 2, 100 dozen; No. 3, 50 dozen.

A. is a leaden generator, which is two-thirds filled with whiting and water; whiting being the cheapest form of carbonate of lime.

B. is the sulphuric acid bottle, which being inverted, discharges its contents into the generator, and the carbonic acid passes into the bottom of the gasometer tub, which contains 200 gallons of water. The gas, cooled and purified by passing through the water, accumulates in the rising bell *C*, which it elevates by its pressure.

The solution pan *K* is kept full by a supply-pipe from a larger cistern, which contains pure water mixed with a proper quantity of soda.

H, the condensing pump, is worked from a crank shaft above it, turned with a winch-handle by one man, a fly-wheel equalizing the motion. A valve-box is placed above the pump-barrel, communicating both with the solution pan *K* and the gasometer *H*.

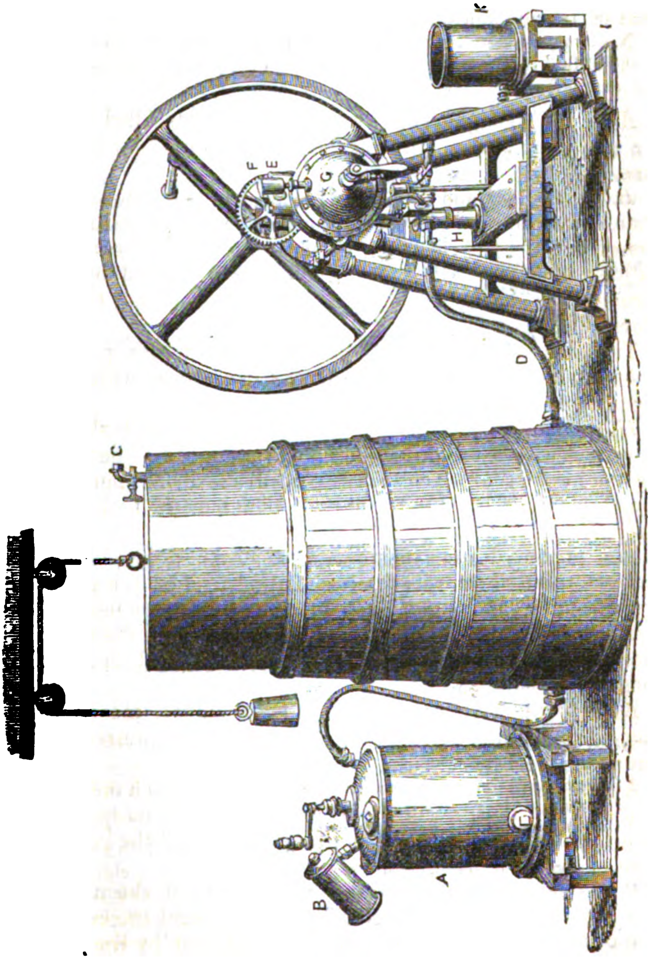
The piston, during its downward stroke, draws both liquid and gas through the valve-box into the barrel of the pump, the proportionate quantity of each being regulated by index-cocks, according to the taste of the manufacturer. In the up stroke, the piston discharges the whole contents of the barrel into the condensing chamber *G*.

An agitator within the condensing chamber, moved by the spur-wheel *E*, rapidly revolving, mixes the compressed gas and water together.

A safety-valve, situated above the condensing chamber *G*, indicates when the pressure is equal to twenty atmospheres, and then the soda water may be bottled off through the cock in the front of the condensing chamber.

It has been an object in the construction of the machine to save labour, and as much as possible to prevent the contamination of the water by metallic particles removed by friction. To ensure absolute purity, the interior of the machine may be coated with silver, and the piston may be constructed of glass or china, an improvement recently introduced with advantage.

We think this apparatus likely to be useful to those who prepare soda water in the country for retail consumption, and it is equally applicable to other kinds of ærated water. For further particulars we must refer our readers to Messrs. Tyler and Son, Warwick-lane, London, where we have seen the apparatus.



GORGED LEECHES.

A pamphlet lately published by M. Chevalier, Professor of the School of Pharmacy, in Paris, contains an account of a fraud which has recently been practised by leech-merchants. The ponds which formerly furnished France with leeches have been for some time exhausted by the cupidity of the collectors who sold the whole stock, young and old, and thus left no chance of reproduction. France has for the last eighteen years been supplied from Egypt, Turkey, Wallachia, Hungary, and Prussia. Between 1827 and 1844 no less than 500,000,000 leeches were imported into France, and the price has increased from fifteen cents to forty cents each. Wholesale dealers buy and sell them by the weight, and in order to increase their profit gorge them with the blood of sheep and other animals, thus making 1,000 small leeches, weight two pounds and a half, value seventy-five francs, equivalent, by the addition of two pounds of blood, to four pounds and a half, and obtaining for them 180 or 200 francs. Several members of the Academy of Medicine have investigated the subject, and confirm M. Chevalier's statement, deprecating the fraud, and warning the public against such an imposition, alike injurious to commerce and to health.

ON THE RESIN OF CERADIA FURCATA.

At a meeting of the Literary and Philosophical Society of Liverpool, held on the 24th of March, 1845, Dr. Watson presented two specimens of an African shrub, called by the sailors "*the coral plant;*" he also presented separate portions of its *resinous secretion.* Mr. Guthrie, who brought the plants to Liverpool, stated that the resin exists in great abundance. The following is the more detailed account, as given by Dr. Watson :—

The natural history of this plant is not much known. The present specimens were gathered by the mate of an Ichaboe ship, Mr. Guthrie, not from off the island of Ichaboe itself, but from the corresponding western coast of Africa, in the most accessible part of the shore, marked down in the Admiralty chart of the spot as "Sandy Beach," from which landing-place a road has been found to the interior, over a desert tract, and the natives have been visited. The habitat of the shrub is among the rocks of the beach, down among the crevices of which the plant sends its serpent-roots in search of nourishment. When seen and gathered it resembles a coral very much in shape and appearance, only having green tufts of spathulose leaves surmounting each horn-like branch. The leathery aspect of the plant is singular, and the *tout ensemble* of it bespeaks it the melancholy denizen of a solitary beach; yet it is, nevertheless, profitable in its hermit-like life, yielding in grateful return for the scanty nutriment it obtains from the rock, a most bounteous and fragrant gum-resin. This may be readily gathered, as it is exuded in the usual nodules of large size, and lies under the shrub, ready to the hand of industrious commercial enterprise. A leading peculiarity of this plant is that the whole tree, bark, wood, and pith, is highly charged with this aromatic juice; to an extent, perhaps, unprecedented in the gum-yielding tribes, or in any resiniferous or balsamiferous tree. Not only is it present in the usual place, between the layers of new and old wood (alburnum and liber), but also everywhere else. In one of the dried specimens, Dr. W. showed that in the wounded parts of the plant, wherever the apex of a branch or bark had been broken, the fracture was sealed up by the exudation, as if it had been thickly coated with varnish. A small specimen of the gum was produced, of a beautiful transparency and bright conchoidal fracture. The whole plant burns rapidly, yielding a fragrant perfume from its loaded frame. It at first appeared to belong to a natural class or family of plants—the turpentine or balsam-bearing—but as there was no flower to examine, and only the anatomy of the vegetable skeleton and the resinoid secretion to furnish data, the true nature could not be ascertained, nor the consequent description given. In the *Glasgow Herald* an account of a coral plant was mentioned, which had been shown to the Philosophical Society there, by Dr. Maclagan, of Edinburgh. Dr. Watson wrote to Dr. Maclagan a few days ago, and received a very polite note by return of post, stating some interesting particulars respecting the plant, which, therefore, had been previously known to the scientific world.

Dr. M. remarks, "when the plant was first shown to me, it was suggested as the probable source of the drug known as *African olibanum*, now occasionally seen in continental commerce, but quite superseded in British trade by the Indian olibanum of the Boswellia; the source of the African olibanum is unknown. The gum-resin of the ceradia is much softer and more aromatic than the African olibanum—at least than the specimen in my museum—but it is somewhat remarkable, that, on looking at my sample of the drug, I found in it pieces of a bark quite undistinguishable from that of the ceradia, and I know that my African olibanum is a very old specimen, and may have lost by keeping. I should rather say that the gum-resin resembles some of the kinds of *elemi*, and might be substituted for it."

Dr. M. believes it to contain soluble oil, resin, and that peculiar substance allied to, but not identical with, gum, which elemi and similar drugs contain. Dr. Maclagan said that Professor Lindley had seen the plant in flower lately (first found in Chatsworth Conservatory), and that it was described in the February number of the *Botanical Register* as belonging to quite a different order—viz., the Compositæ. Professor Lindley mentions that Dr. Maclagan had sent him the first dead specimen in December last, covered with a peculiar red lichen—the *Dufourea flammea*—when he found it impossible to guess what manner of plant this curious production might be. Dr. Watson's specimens were also covered with a brownish lichen. Professor Lindley had since, from seeing it in flower at the Horticultural Society, been able to determine the natural order of it, which he found to be allied to those fleshy-stemmed shrubs from the Cape of Good Hope, now termed *Kleinias* (the old Cacalias). Bright veinless leaves, of rather a succulent character, grow in clusters at the end of the horns or branches; the pale yellow flower grows from between the footstalks of the leaves supported on shorter similar pedicles.

The Professor states that "the resin when burned was totally destitute of fragrance, and evidently had nothing to do with any of the drugs to which the name of *Olibanum* has been applied." The absence of fragrance in the resin, as above quoted from so high an authority, was remarkably at variance with the fact of the fragrant odour of the resin which Dr. Watson burned before the society. The article must vary: possibly the specimens may represent different species of the same genus.

The name of the shrub is *Ceradia furcata*, derived from the Greek and Latin terms for its horny shape. If the gum-resin proves, on further examination, to be what Dr. Dickinson seemed inclined, from his own observations, to consider it, as possibly one of those gum-resins mentioned so often in scripture under the general term of frankincense, then the general name being retained as characterising the plant, the specific name might, perhaps, be changed to one in accordance with the qualities of the exuded juice, instead of being, as it at present stands, scarcely more than a reiteration of the generic character. The *forked horn* plant may become the

Ceradia thurifera, or something of like meaning. Dr. Watson observed, that on going to the Botanic Garden here, he had been gratified at finding under the watchful care of the conservator, Mr. Shepherd, a young plant actually in leaf which he had received from Mr. Hadwen three months ago, with but the faintest hope of its being alive or rearable; however, it shot forth its green tufts, under glass, and now looks healthy and promising, and probably will send out its little yellow flower in the course of the ensuing summer. The horns are much stouter than the dried, and evidently much older plants of Dr. Watson's; their three-forked or trichotomous extremities, each with its crest of leaves, corresponded exactly with the new nomenclature of the exotic; the bark was also smooth and void of lichen. The old dry shrubs did not show the same undeviating partiality for the number three, some branches being content with a bifurcation, others running to the excess of four-prongs. Was it possible that the resin of the younger plant might be comparatively inodorous, whilst that from the mature tree was fully endowed with an aromatic essential oil.

Dr. Watson showed a green leaf of the plant, and also a diagram of the sections of the branch and root, as seen through a lens, together with a drawing of the shrub. He also stated the specific gravity of the resin to be 1.234, which is much higher than that of amber, which Liebig states at 1.065, to which *fossil pseudo-balsam* it bore some general resemblance, but which disappeared on analysis.

The chemical constitution of the resin was given, as ascertained upon examination of a small portion only, by the kindness of Dr. Brett, at the laboratory of the Royal Institution. Dr. Watson considered that the article might very likely prove of commercial value sufficient to remunerate any persons for gathering both the shrub and its resinoid, as it might be yet found useful in the healing, or social arts.

The President hoped the subject would be further pursued, as it was likely to prove an interesting field for research.

Mr. Guthrie was present, and, in reply to questions from members as to the probable quantity of the article, stated that he considered there was a good deal, and that he could have got bags full of it if he had then known its interest or value. He presented a specimen to the Society, for the museum of the Royal Institution, having a root attached, showing its rocky habitat, also a specimen of the resin.

Dr. Watson has subsequently obtained another of the pieces, and his friend, Dr. Brett, has analysed it; the results of the examination, as being verifications and extensions of the first essay, are now given as follow :—

Physical Characters.—It is translucent; of a pale yellowish colour when dry, resembling ordinary specimens of amber or gum arabic, but of a greenish tinge when taken from the stem of the living plant. Both the recent and that which has been kept, possess the fragrance already alluded to, and which adapts it so well for burning as a frankincense. Its fracture is bright and conchoidal, and it is remarkably brittle under the knife or file.

Chemical Properties.—It is only partially soluble in alcohol. Upon evaporating, the alcoholic solution—a yellow, oily-looking substance—remains, giving off whilst hot a vapour which has a peculiar aromatic odour. This substance, the residue insoluble in alcohol, appeared, however, to be a mixture of volatile oil and resin. The colour is associated with the oil and resin. The *insoluble* residue was treated by ether, which appeared to extract the same sort of substance as had been extracted by alcohol—viz., the oleo-resinous matter. The white powder not soluble in alcohol or ether was not dissolved by boiling water, nor by a mixture of equal parts of rectified spirit and water. *Iodine* did *not* render it *blue*. When heated *per se*, it gave off a vapour which had an aromatic odour: it finally fused, burnt with fuliginous flame, and left a carbonaceous residue. The white powder insoluble in alcohol and ether, became of a deep brick-red colour in cold nitric acid. When acted upon by hot nitric acid red fumes were given off, and an orange red-coloured residue was obtained by evaporating the acid. This residue had no bitter taste. This residue, after being exhausted by alcohol and ether, yielded to water no gummy matter. A small quantity only having been acted upon by nitric acid, no evidence of oxalic acid could be detected When boiled in a solution of caustic alkali little or none appeared to be acted on; in which respect, therefore, it differs from the gum-resins. The essential oil of turpentine scarcely acts upon it.

From the foregoing chemical experiments, it may be concluded that the substance in question cannot be classed among the gum-resins, as shown by its indifference to certain menstrua which notoriously act upon the last-named bodies.

Nor does it appear to contain that description of vegetable mucilage somewhat allied to gums, and called *Bassorine.* The incomplete action of alcohol and alkalies upon it, clearly throw it out of the list of ordinary resins, such as colophony, guaiac resin, cobaina [?] resin, elemi resin, animi resin, and others.

The more decisive analysis, subsequently given by Dr. Brett, is the following :—

The substance was burnt in the usual way with oxide of copper. The following is its composition in 100 parts :—

Carbon	71.17
Hydrogen	9.56
Oxygen	19.27
	100.00

If the atomic constitution be deduced from this analysis we shall have the following formulæ :—

$$C_{24}\ H_{19}\ O_{6}$$

There is a resin noticed by Thomson in his *Organic Chemistry*, and also by Liebig, called *Pasto-resin*, which appears to have been analysed by Boussingault, the composition of which is identical with the Ceradian-resin. The per centage composition of the Pasto-resin :—

Carbon	71.43
Hydrogen	9.52
Oxygen	19.05
	100.00

This establishes an interesting example of Isomerism. We have not, however, as yet had an opportunity of studying the physical and general chemical character of the so-called Pasto-resin.

Dr. Watson thinks it highly probable, from a variety of facts, that this was the frankincense mentioned in scripture; but Dr. Maclagan, who corresponded with him on this point also, does not speak decisively.

There are two specimens of the living plant in town at present, to which those in the society who are intimate with the subject will look with considerable interest.—*Proceedings of the Literary and Philosophical Society of Liverpool*, 1845.

ON A VERY INFERIOR CINCHONA BARK FOUND IN COMMERCE.

BY ST. GEORGE, APOTHECARY IN GIESSEN.

Since the discovery of quinine, ash cinchona (*Ten* or *Jaen China*) called also pseudo-loxa, has been entirely rejected on account of its being deficient in this alkaloid. It is however frequently met with in commerce. The outward appearance of this bark is remarkably fresh; and its colour is, on the whole, blackish slate gray, which is given to it principally by lichens which thickly coat it. Larger and more slightly adhering lichens are rarely to be found in it; whereas the genuine loxa is more frequently covered with them, by which it obtains a somewhat variegated appearance. The transverse cracks of the ash cinchona (*Ten China*) are very short and close together; those of the genuine bark more annular and farther apart. Ash cinchona is only about a quarter of a line thick, on account of the thinness both of the cortex and alburnum [*Splint*]; whereas the loxa is at least half a line thick. For this reason, we find less entire and closed quills than such as are broken lengthways and blistered; by which the inner, and for the most part, bright, rust-coloured, or sometimes pale yellowish surface is more exposed than in the quills of the other kind of cinchona. In this way, the ash cinchona acquires its peculiar fresh appearance. Thin splinters of wood, adherent to the internal surface, are also frequently met with.

When broken, the alburnum [*Splint*] generally appears much brighter, and when seen in opposition to the rust-coloured surface, is almost of a straw-colour, whilst genuine loxa on breaking presents uniformly a cinnamon brown colour; and externally is dusty, and therefore appears less fresh. The tranverse and oblique fracture of the ash cinchona gives no trace of resin; whereas the horn-like appearance of the cut surface of the loxa bark shows a considerable proportion of resin. A decoction of the ash cinchona does not become turbid on cooling; its taste is acidulous, very astringent, and not at all bitter; whilst the decoction of a very good cinchona becomes on cooling like coffee with milk, and has an acid, but less astringent, and very bitter taste. It is advisable to reject both sorts, to be the more sure of not obtaining the ash cinchona.—*Jahrb. f. Prakt. Pharm.*, x, pp. 103-4.

ON THE DISTILLED WATERS WHICH CONTAIN PRUSSIC ACID.

BY G. H. ZELLER.

Zeller is of opinion, that the leaves of the cherry-laurel gathered in wet and cold weather, yield more hydrocyanic acid than those collected in dry and hot weather. He is doubtful whether, in a northern climate, more acid and less oil are produced than in a southern one, though the above observations respecting the effect of the weather would lead us to infer that such would be the case. The proportion of oil contained in the *aqua lauro-cerasi* is difficult to be determined. The reason why much of the commercial water brought from the south is rich in oil but poor in prussic acid, is perhaps referable to the circumstance that part of the acid has combined with the metal of the bottles in which it is usually preserved and exported, and in this way, cyanide of copper has been formed. With reference to the influence of time on the aqua lauro-cerasi, the author has made the following observations:—

A certain quantity of the water which yielded soon after preparation 2.80 grains of cyanide of silver, yielded at the end of one year only 2.70 grains, and after four years only 2.40 grains. Another sample had lost only 0.33 grains in four years. Paton obtained almost the same proportion of cyanide of silver from cherry-laurel water, which had been kept ten years as from the fresh made water.

Aqua foliorum persicorum.—The leaves of peaches contain, according to Winckler, the same constituents as the cherry-laurel leaves, and yield a distilled water having the same composition and strength as cherry-laurel water.

Aqua amygdalarum amararum.—From twelve ounces of bitter almond water obtained by the distillation of six pounds of bitter almonds, Zeller obtained fifteen grains of cyanide of silver; and on another occasion, from sixteen ounces of the water obtained from four pounds of the bitter almonds, nine grains of cyanide of silver. With reference to the effect of time on the water, he obtained the following results:—One ounce of the water prepared after Geiger's methtod, yielded, when fresh, 5.120 grains of cyanide of silver; corked in a full bottle after eight days, 5.080 grains; in a full bottle, corked, tied over with bladder, and pitched, 4.90 grains after one year; and 4.50 grains after four years; merely corked in a bottle two-thirds full, 4.62 grains after one year.

The following is a table of the proportions of cyanide of silver afforded by bitter almond water, prepared according to different methods, from equal quantities of bitter almonds.

Authority	Method of Preparation.	Cyanide of silver from 1 ounce.	Observations.
		grains.	
Liebig	Fresh prepared without spirit of wine	5.35	See *Handb. d. Pharm.*
Geiger	Chloride of calcium bath, without spirit	5.0	In minimo, *Ph. Univ.*
Hänle	Without spirit	5.0	
Zeller	Fresh prepared ditto	5.12	
"	After four years, ditto	4.50	
"	Fresh prepared in the still rectified with spirit	4.88	
"	After one year's ditto	4.12	
"	Fresh, without oil and spirit ditto	4.20	
Duflos	According to the Prussian Pharm.	4.20	Calculated at 0.175 per cent. prussic acid
"	Saturated water without spirit	2.83	*Kastner's Archiv.*, vol. xiv.
Balle	After previous digestion with spirit	4.0	Maximum *Central Bl.*, 1844, No. 23.
"	Ditto	2.5	Minimum
Wackenroder	According to different methods	3.75	In Maximo
Geiseler	According to the Prussian Pharm.	4.49	Calculated at 0.104 per cent. prussic acid
Hamb. Ph.	Ditto	2.50	℥j=0.5 grs. prussic acid
Prussian Ph.	In the still with spirit of wine	3.54	℥j=1.25 grs. Prussian blue =14.16 cyanide of silver
"	Ditto	2.09	6.4 grains Prussian blue=10.7 cyanide of silver

Aqua Cerasorum.—The proportions of prussic acid in sixteen ounces of this water were as follows :—

Authority	Method of Preparation.	Grains of Cyanide of Silver.	Observations.
	FROM FRESH CHERRIES.		
Winckler	1lb. : 1½lb. of water	0.138	℥iij *Aq. Concent.*
Zeller............	In equal proportions.......	0.368	From 4½lbs. of cherries= 0.933 grs. cyanide of silver
Geiger	Ditto	2.00	*Pharm Univ.*
Ph. Wurt.	From 1lb. : 1lb. of distilled liquid......	0.553	According to Zeller, 1840
"	Ditto	0.20	According to the same, 1841
	FROM DRIED CHERRIES.		
Ph. Boruss. ...	From 1lb. : 1lb of water	0.27	According to Zeller
"	Ditto	0.64	Geiseler
Ph. Bavar. ...	From 1lb. : 8lb. water ...	2.56	The same
	FROM CHERRY-STONES.		
Geiseler	From 1lb. : 8lb. water ...	1.90	℥iv cherry-stones=3.8 grs. cyanide of silver
Zeller............	Ditto	0.47	
	FROM CHERRY-KERNELS.		
Ph. Badens. et Aust.	From 1lb. : 8lb. water ...	2.36	According to Zeller
	FROM BITTER ALMONDS.		
Ph. Hamb.......	From 1 *aq. amygd.* and 31 *aq. dest.*	1.25	℥j aq. amygd.=2.5 grs. cyanide of silver
Ph. Hann........	From 1 *aq. amygd.* and 1 measure water	1.43	1 measure=56 ounces
Hänle............	1 *aq. amygd.* and 24 *aq. dest.*.........................	3.20	*Buchn. Repert.*, vol. xvii.
Ph. Sax.	Ditto	3.3	ʒj *Aq. amygd.*=5 grs. cyanide of silver
Ph. Slesvic. et Hass.	1 *aq. amygd.* and 12 *aq. dest.*.........................	6.6	The same.

Aqua florum Acaciæ.—Four pounds of the fresh gathered leaves yielded four pounds of a distilled water, having a strong smell like that of bitter almonds. Eight ounces of this water yielded with crystallized nitrate of silver a precipitate of 4.15 grains of cyanide of silver. From an experiment made with dried leaves, it appeared that they had lost all the prussic acid.

Zeller found also prussic acid in the leaves of the *sweet-almond tree.* From leaves gathered in the first days of September, he obtained by the distillation of equal parts, a liquid, one ounce of which yielded 0.575 grains of cyanide of silver.—*Pharm. Central Blatt,* 17 Sept. 1845.

ON THE ACTION OF SULPHURIC ACID ON MORPHIA.

BY A. E. ARPPE.

If morphia be dissolved in an excess of sulphuric acid, and the solution evaporated until decomposition begins, a white substance is precipitated on the addition of water to the brown mass. This white body is not sulphate of morphia, and indeed does not contain any morphia. Its properties are as follows:—It is white, and is always purer after drying than in the moist state; yet it often has a tinge of brown, which cannot be removed by the usual methods of purification. When washed in the fluid it easily falls down in large cheese-like flakes, which become very much shrivelled during evaporation. Examined with a microscope, which magnifies two hundred times, it appears as a perfectly homogeneous, not crystalline, substance, composed of globules. If it be exposed to the atmosphere, its surface becomes gradually greenish, and though soluble in water, its solution is decomposed by boiling, and assumes an intense emerald-green colour.

Alcohol and ether do not affect it; but it is easily dissolved, without alteration, in acid liquors, especially if sulphuric or muriatic acid be present. From diluted solutions it is precipitated on evaporation. In the acid solutions, potash and ammonia occasion copious precipitates, which are easily dissolved by an excess of the precipitant. Carbonate of ammonia also produces a precipitate, but does not dissolve it. A remarkable characteristic of these precipitates is that, when exposed to the air, they assume a more or less dark-green colour, being changed into another substance, which contains only $\frac{2}{3}$ths of the sulphuric acid of the white substance.

The organic ingredient of this combination is, with respect to its equivalent, equal to four atoms of morphia, and may, therefore, be expressed by the formula $4\,(C_{35}\,H_{20}\,N\,O_6) + 5\,S\,O_3$. If we now suppose morphia to be a double combination of ammonia, we may express its sulphate (which, like the salts of organic bases in general, contains one atom of water) by the formula $C_{35}\,H_{17}\,O_6 + N\,H_4\,O,\ S\,O_3$; that is, it contains, instead of ammonia, an atom of oxide of ammonium. When heated with sulphuric acid, the water is driven off and ammoniacal sulphates obtained, discovered by H. Rose, in which the ammonia is combined with sulphuric acid. Of these combinations the neutral one is $= N\,H_3,\ S\,O_3$; and the acid salt, which Jacquelain analysed, $= 3\,N\,H_3 + 4\,S\,O_3$. If these two salts be formed in the examined substance, the above-mentioned combination must necessarily take place, and the rational formula will therefore be

$$(C_{35}\,H_{17}\,O_6 + N\,H_3) + S\,O_3 + 3\,(C_{35}\,H_{17}\,O_6 + N\,H_3) + 4\,S\,O_3.$$

This is supported by the fact, that if anhydrous sulphuric acid be conducted over efflorescent morphia, this substance is produced; but the change which the morphia undergoes on this occasion must be considerably more complete, since it cannot be precipitated from this combination. The circumstance that a part of the sulphuric acid is precipitated by chloride of barium, whilst none is precipitated in the ammoniacal salt, is not quite in unison with the idea expressed here, but may be explained by supposing a decomposition effected by the acids used for the solution.—*Annalen de Chem. und Pharmacie*, lv., pp. 96, 101.

ON THE ACTION OF BITTER ALMONDS, CHERRY-LAUREL LEAVES, PEACH BLOSSOMS,

And their Distilled Waters, on Essential Oils and Aromas generally.

BY M. MAHIER.

The observations first made with reference to the action of the syrup of almonds in destroying the smell of musk, the truth of which was confirmed by M. Soubeiran, and has since been fully recognised; and subsequently with reference to the action, under similar circumstances, of cherry-laurel water, which was noticed by M. Fauvé, of Bordeaux, have induced me to generalise this re-action on essential oils, and on other strongly odourous substances.

The results I am about to describe, although they may not contribute much to scientific knowledge, will nevertheless possess some practical interest, if it be only in affording a quick and easy method of purifying bottles, and other vessels, from odours which it is found difficult otherwise to remove.

Having recently tried to remove the smell from a marble mortar, which had been used for the preparation of an asafœtida mixture, by the use of vinegar and cinders, the result of which was imperfect and unsatisfactory, I tried the use of bitter almond paste; on rubbing some of this in the mortar, as the smell still continued, I added a little water, which developed the bitter almond smell; this was again rubbed, and the mortar subsequently washed out with water, when it was found that the smell of asafœtida was entirely removed.

This first trial induced me to apply this method to the cleansing of vials and bottles, which had contained camphor, spike oil, essences of clove, peppermint, neroli lavender, and turpentine, oils of petrolium, copaiba, and cod-liver, creosote, and other odourous substances. All the bottles which had contained the foregoing ingredients, were rendered perfectly odourless, and fit for any use.

It is necessary in those cases where the bottles have contained oily substances previously, to cleanse them from the oil by means of cinders or potash; and those having contained resins should be rinsed out with spirit before using the almond paste.

Cherry-laurel leaves and peach blossoms, reduced to a pulp and introduced into the bottles, produce the same effect. The distilled waters, also, of cherry-laurel leaves, peach blossoms, and bitter almonds, especially when recently prepared, act in the same manner, with similar precautions, but their use would be more expensive.

After these experiments, I think I may state that bitter almond paste, the pulp of cherry-laurel leaves, or peach blossoms, may be applicable to the preservation of fish and meat during their transport, as they would at the same time serve as a condiment. The distilled waters of the above substances, also, might be used to purify the atmospheres of dissecting-rooms, newly painted apartments, hospital-wards, &c.—*Journal de Chimie Médicale.*

ON A SPECIES OF CONFERVA FOUND ATTACHED TO SMALL FISHES,

WHEN IN A STATE OF DISEASE.

A CORRESPONDENT having recently alluded to a disease common among small fishes, and expressed a wish for some information on the subject, we have extracted the following account from *Chambers' Miscellany*:

"One of the most extraordinary of microscopic plants, is the Achlya prolifera, whose soft silky threads may sometimes be seen adhering to the surface of gold-fishes, and covering them as it were with a whitish slime. This appearance is generally looked upon as species of decay or consumption in the animal itself, and not as an external clothing of parasitic plants. It is, however, a true vegetable growth, each individual consisting of a single filament, with a minute pear-shaped ball on the top, containing numerous grains, which are the seeds or embryos of future plants. The green slime, which in summer gathers over the surface of stagnant water, is of the same order of vegetation, namely, Confervæ, an order entirely dependent upon water for their growth and propagation, and to which drought is certainly fatal. The Achyla has been examined by Dr. Unger, who describes it when at its full growth, as consisting of transparent threads of extreme fineness, packed together as closely as the pile of velvet, and much resembling in general appearance, certain kinds of mouldiness. When placed under the microscope, for the unassisted eye can perceive nothing of its true construction, each thread is terminated by the pear-shaped ball already alluded to, which is about 1.200th of an inch in diameter, and consists of a single cell filled with a mucilaginous fluid, in which float the procreative granules. The contents of this cell are seen to be in constant motion from the earlier stage of their existence; but as they advance to maturity, the mucilage disappears, and then the motion of the granules becomes more rapid and violent, till ultimately they burst their way through the cell, and are transferred to the water, there to perform their circle of being, and to give birth to new races of granules. All this takes place with such amazing rapidity, that we are assured an hour or two suffices for the complete development and escape of the spores; so that we need not wonder when we are told that once established, the Achyla prolifera will often complete the destruction of a healthy gold-fish in less than twelve hours."

OBSERVATIONS ON THE COLOURING MATTER OF COCHINEAL.

BY A. E. ARPPE.

PREISSER prepares the colouring matter of cochineal (*carmine*) in a very simple way. He exhausts cochineal by means of æther, and then makes an aqueous decoction, and precipitates the carmine by means of the so-called hydrated oxide of lead. The lead precipitate is then decomposed by sulphuretted hydrogen, and the liquid, which is said to be colourless, is evaporated until crystallization takes place. The crystals, which are also colourless, are called *carmein*. Exposed to the air, they gradually acquire colour, and are converted into *carmine*, first becoming yellow and then red.

The lead preparation which Preisser uses, he obtains by adding ammonia to a solution of nitrate of lead, and the precipitate he calls hydrated oxide of lead; but every Chemist knows that the compound thus obtained is not hydrated oxide of lead, but a basic salt, whose composition is expressed by the following formulæ: $2\ (3\ PbO,\ NO_5) + 3\ HO$. Arppe has prepared this salt and made experiments with it in the way directed by Preisser, but observed scarcely one of the phenomena which Preisser describes. The colouring matter is certainly precipitated by the lead salt, and the fluid becomes decolourized; but if the well-washed precipitate be decomposed by sulphuretted hydrogen, sulphuret of lead is obtained, and the colouring matter becomes diffused through the fluid, which has a red colour, and is strongly acid. If this fluid be evaporated, vapours of nitrous acid are immediately perceived, and on cooling the solution, nothing is precipitated from it. If the process of evaporation be continued, decomposition takes place through the action of the nitric acid, and a copious development of gas takes place; the fluid becomes yellowish, and a yellow precipitate appears. After some time, distinct crystals are formed in the liquid; and these have a rhombic form, with two-sided pointed summits. These crystals are no doubt identical with those which are formed when nitric acid acts upon carmine, and which Pelletier and Caventou maintain were not oxalic acid; but the crystals which the author obtained were oxalic acid. When dissolved in water, they yielded, with lime-water an abundant precipitate, insoluble in acetic acid, and which, when heated, evolved an irritating vapour, which excited coughing. These properties are characteristic of oxalic acid.

Pelletier and Caventou have shown that the aqueous infusion of cochineal contains an animal substance, which is precipitated by nitrate of silver. After having made use of this purifying means, the author precipitated the colouring matter by acetate of lead, and treated the precipitate with sulphuretted hydrogen. But the red fluid became then strongly acid, as has already been observed by Berzelius, and the acid was not derived from the lead salt. The dark red mass obtained by evaporating the liquid to dryness, had the smell of burnt sugar.

To find out the relation of the pure hydrated oxide of lead to the solution of carmine, Arppe precipitated the [oxide of] lead from the acetate of lead by means of potash, and exposed the mass to a moderate heat. The precipitate was well washed, and, when dry, gave no trace of acetic acid. This hydrate acts peculiarly on the colouring matter of the cochineal. In the cold it does not precipitate the colouring matter, but by boiling, it throws down a blue colouring matter. If this precipitate be decomposed by sulphuretted hydrogen, the liquid is only slightly coloured, all the colouring matter having become precipitated with the sulphuret of lead, to which it adheres so strongly that it cannot be separated from it either by water, alcohol, ammonia, or potash; only hydrosulphuret of ammonia and the acids indicate its presence. If the solution of the colouring matter be evaporated in hydrosulphuret of ammonia, the blue reaction of the ammonia shows itself gradually, accompanied by a simultaneous formation of sulphuric acid.

In order to combine the acid (which adheres to the carmine) with a base, the author mixed a very concentrated solution of cochineal (which had been previously purified by the nitrate of silver) with ammonia, and digested the solution with hydrated oxide of lead. The colourless ammoniacal liquid, poured off from the precipitate, also actually became strongly acid during evaporation; but by treating the precipitate with sulphuretted hydrogen, the feebly coloured fluid also became acid, and the colouring matter was precipitated with the sulphuret of lead. Pelletier and Caventou say, that they have prepared the pure colouring matter of the cochineal by ether and alcohol, but great doubts must exist as to the accuracy of this statement. We may, therefore, with tolerable certainty declare, that the pure colouring matter of cochineal is as yet unknown.—*Ann. der Ch. und Pharm.*, Bd. LV. Heft. 1.

CHEMICAL ANALYSIS OF MYRRH.

BY CHR. RUICKOLDT.

Myrrh, which is obtained according to Ehrenberg from the *Balsamodendron Myrrha*, exudes as an oily juice, which subsequently concretes like the gum from the cherry-tree. The greatest quantity for the markets is imported from Kahira; this is the *Myrrha naturalis*, which is then sorted for the market, and sold as:

I. *Myrrha electa.*—Irregular large and small angular pieces or tears, of a bright yellow or dark brown colour, semitransparent, covered with powder, or shining. On fracture they are uneven, with a lustre of wax or fat, and intersected with white curvilinear veins. The odour is peculiar; the taste balsamic and bitter. The specific weight is, according to Martius, 1.360. On breathing on the pieces, they assume a brighter lustre, and feel then fatty. On chewing myrrh, it crumbles and adheres to the teeth, the saliva at the same time becoming milky. When heated, it swells and burns with a bright flame, emitting much carbon.

II. *Myrrha naturalis* consists of the impurer pieces of the last variety, but we also find impurities peculiar to it, such as *bdellium, gum Arabic* moistened with tincture of myrrh, also *cherry-tree gum*, &c. Bdellium resembles myrrh in appearance, and has a similar bitter taste, but a different, less powerful odour, and contains more bassorine.

III. *Myrrha Indica* (*Myrrha nova*).—Irregular pieces, oftentimes 3''' in thickness, of a brownish-white, greenish, nearly black colour, in opaque faintly shining drops. The odour is myrrh-like, so also the taste, but rather more bitter.

Martius distinguishes another variety, called *Myrrha alba*, which is sometimes mixed with the last variety; the pieces resemble gum ammoniacum, are more or less globular, tear-shaped, or angular, with a wax-like lustre or fracture. The odour is like myrrh, the taste intensely bitter.

Myrrh has been analysed by Brandes, 1819, and afterwards by Braconnot, Pelletier, and Bonastre. The myrrh analysed by the author, was of that variety called *Myrrha nova*. It consisted of irregular, knotty, roundish, tear-shaped pieces, of the size of a hazel nut, its colour was yellow, with a red tinge, and sometimes darker.

On fracture, when fresh, it had a wax-like lustre; in some places, a resinous appearance, with white opaque striæ, and amygdaloid indentations of the same colour. Odour peculiarly aromatic, taste similar, but bitter. Specific weight 1.120—1.180. On trituration, the myrrh balled, and left a fat stain on paper. On application of heat it did not melt, but swelled, emitted white fumes of an aromatic odour, and soon carbonized on continuation of the heat. It left 3.650 per cent. of white ash, consisting chiefly of carbonate of lime, with carbonate of magnesia, a little gypsum, and oxide of iron. Potash and phosphoric acid, as mentioned by Brandes and Braconnot, could not be detected. Concentrated nitric acid gave the myrrh a black brown colour; sulphuric acid assumed with it a dirty violet hue. On continuation of the action on the resin it fell to pieces, and an orange-coloured sediment deposited. On heating it with concentrated nitric acid, it became dark brown, then violet-coloured flocculi separated, which soon disappeared, leaving an orange-coloured resinous residue. To determine the quantity of water, 0.764 gr. were powdered and heated in a bent tube at 203° Fahr., until the fluid ceased to pass over. The fluid thus collected was clear and colourless, reacted faintly as an acid, and amounted to 1.475 per cent. of the myrrh used. The residue was half melted, became more fluid on augmenting the heat by aid of a spirit lamp, and yielded a yellow turbid acid solution, on which swam dark brown drops of an empyreumatic oil. Yellowish white fumes were also emitted.

Fifteen grammes of myrrh with twenty times the quantity of water, were heated in a retort until half passed over. On cooling the apparatus, the upper part of the retort and the receiver were covered with a white resinous substance, which was soft, but subsequently became hard and brittle. The product of distillation was milky, and deposited yellowish white flocculi, but no oil. On removal of the fluid, the resinous coating was dissolved in alcohol, and left on slow evaporation a bright brown firm resin, which was perfectly soluble in spirit, almost wholly soluble in ether and caustic potash; with nitric acid it formed a dark brown mass, and was but slightly dissolved by acetic acid. Nearly all the gum of the myrrh was dissolved during distillation, so that very little remained on the filter. The clear filtered solution left on evaporation a brownish extract, which, when heated repeatedly with warm spirit, left a brown friable mass. The alcoholic extract left on evaporation a soft resin, which was very soluble in alcohol, was not precipitated by water, and reacted as an acid. Ether produced no change in it; nitric acid dissolved it, forming a clear red brown solution, which became yellow on standing for several hours. Caustic potash yielded with it a clear brown fluid, leaving a few flocculi.

Thirty grammes of powdered myrrh were digested in alcohol of 0.8310, at a temperature of about 160.8° Fahr. The residue was a yellow white friable powder, with a faint taste and odour of myrrh, amounting to 48.330 per cent. Iodine showed no traces of starch in it. It was soluble in cold water, but more readily so in hot; on the filter it left a residue, yielding some resin with spirit, and amounting, when wholly exhausted to 3.862 per cent. The filtered aqueous solution yielded no coagulum on boiling, but left a gum-like, brittle, vitreous substance. A concentrated solution, when mixed with double its volume of spirit, became turbid, and gave with nitrate of protoxide of mercury a white precipitate, soluble in an excess of the reagent, and a white precipitate with and insoluble in an excess of the nitrate of the peroxide of mercury. Sugar of lead produced a white precipitate; chloride of iron a transparent jelly, as did also borax. On boiling with nitric acid, the gum was converted into mucic acid, and a little oxalic acid. The alcoholic extract was carefully distilled. When the half of the spirit had passed over the contents of the retort, it became turbid, and deposited an oleaginous substance. The latter was removed, and the distillation continued, when a fresh separation took place. To remove the water and spirit from this balsamic substance, it was placed for some days under a glass bell with chloride of calcium; the result was, a brown red clear fluid, of the consistence of thin turpentine, with a powerful taste and odour of myrrh. Alcohol redissolved it, forming on the addition of water, an acid solution. Ether dissolved it perfectly, cold nitric acid produced a chocolate coloured solution; on application of heat, it formed a porous mass, becoming yellow brown; the acid assumed a violet colour, which afterwards changed to yellow. Acetic acid formed with it a violet red solution; caustic potash produced very little effect upon it. The composition of this balsamic substance is

Carbon	77.130...	22 =	77.40
Hydrogen	8.870...	15 =	8.68
Oxygen	14.000...	3 =	13.92
	100.000		100.00

To determine the quantity of volatile oil, the alcoholic solution was distilled until the residue became thick. On removing the spirit, a few grains of water were added, and the heat was augmented. A slightly yellow oil passed over with the aqueous vapour. The addition of water was renewed, and the distillation continued as long as traces of oil could be distinguished in the fluid passing over. The remaining resin became on cooling brittle, clear, and of a bright red brown colour, spirit dissolved it almost totally, and water formed with it a white turbid acid solution. It was soluble in ether. Nitric acid rendered it first violet, then brown; caustic potash had very little action upon it. The distilled myrrh-oil (*myrrhol*) was of a bright yellow colour, viscid, and of a penetrating odour, and taste of Myrrh. By standing, it became thicker and darker in colour; the quantity amounted to 2.183 per cent., it was lighter than water, heavier than spirit; ether and spirit dissolved it readily. The composition of *myrrhol* is :—

	I.	II.	*Mean.*		
Carbon.........	79.820......	80.150.........	79.965.........	22 =	80.440
Hydrogen ...	9.867......	10.430.........	10.149.........	16½ =	9.920
Oxygen	10.313......	9.420.........	9.866.........	2 =	9.640

It is remarkable, that the composition of myrrhol corresponds with that of colophony and sylvic acid. The resin of myrrh was obtained in a distilling apparatus, as an alcoholic solution; subsequently it was freed of its alcohol by evaporation. A portion of the oil still adhered to the resin; it was of a red brown colour, transparent, brittle, with a conchoidal fracture, and amounted to about 44.760 per cent. On application of heat, it emitted vapour, with an odour of myrrh, readily took fire and burned, leaving but a slight trace of residue. Its melting point is between 194° and 203° Fahr.

It is soluble in ether, partially soluble in spirit. The solution became turbid on adding water, and did not redden litmus. With muriatic acid it gave a flocculent turbidity, and a caustic solution of potash partially dissolved it on boiling. Acetic acid and sulphuric acid yielded a clear solution. This resin is neutral, and may be termed *myrrhin*. Its composition is:—

	Mean.		
Carbon	72.400	24	= 72.24
Hydrogen.	8.152	16	= 7.92
Oxygen	19.448	3	= 19.84

A small quantity of resin was heated in a glass tube at 355° Fahr., until it ceased to froth. The fluid which collected at the other end of the tube was clear like water, with a powerfully acid odour and taste. A small quantity of a soft resinous substance deposited on the walls of the tube. When cold, the mass was dark red or brown, very brittle, shining, and almost tasteless and odourless. Ether and spirit dissolved the resin completely, and the latter solution became turbid on addition of water, and reacted as an acid. Nitric acid assumed a violet hue with it, but on heating it became yellow. Sulphuric acid gave with it a red-brown clear solution. As this acid resin is formed by melting myrrhin, it may be termed *myrrhinic acid*. Its composition is

	I.	II.	*Mean.*		
Carbon	75.430	75.310	75.370	24	= 75.222
Hydrogen	7.946	8.063	8.005	16	= 8.250
Oxygen	16.624	16.627	16.625	4	= 16.528

In this analysis, we therefore found in 100 parts of myrrh

Volatile Oil (*Myrrhol*)	2.183
Resin (*Myrrhin*)	44.760
Gum (*Arabin*)	40.818
Water	1.475
Impurities	3.862
Carbonate of Lime and Magnesia	3.650
Gypsum and Oxide of Iron	
	96.748.

Myrrhol undergoes decomposition on exposure to the air merely; also the resin decomposes when heated alone in water. The (watery) extract of myrrh, therefore, contains probably an altered resin. It is also probable, that the semi-resin found by Brandes and named by Bonastre *subresin*, is formed during the analysis by decomposition of the myrrhin by the formula obtained, we may recognise the transition of the oil to the resin; if we double the equivalents we have—

Myrrh	$C_{44}\ H_{32}\ O_4$
Myrrhin	$C_{48}\ H_{32}\ O_{10}$
Myrrhinic Acid	$C_{48}\ H_{32}\ O_8$

The quantity of oxygen is less in the acid than in the neutral resin. The latter may contain a portion of its oxygen and hydrogen in the combination of water. The balsam is undoubtedly a mixture of the oil and resin, and forms the transition from the former to the latter.—*Pharmaceutisches Central Blatt*, No. 20.

CACHOU AROMATISÉ.

Cachou de Bologne; *Aromatic Pastilles of Catechu of the Italians.*

This preparation, which owes its origin to the Italians, may be easily made according to the following formula :—

Take of Extract of Liquorice and Water, of each 3½ ounces

Dissolve by the heat of a water-bath, and add

Bengal Catechu, in powder, 462 grains
Gum Arabic, in powder, 231 grains

Evaporate to the consistence of an extract, and then incorporate the following substances, previously reduced to fine powder :—

Mastic, Cascarilla, Charcoal, and Orris root, of each 30 grains.

Reduce the mass to a proper consistence, remove it from the fire, and then add,

English Oil of Peppermint, 30 drops
Tincture of Ambergris and Tincture of Musk, of each 5 drops.

Pour it on an oiled slab, and spread it out by means of a roller to the thickness of a sixpenny piece. After it has cooled, apply some folds of blotting paper to absorb any adhering oil; moisten the surfaces with water, and then cover it with sheets of silver leaf. It must now be allowed to dry, then cut into very thin strips, and these again divided into small pieces, about the size of a fenugreek seed. These are extensively used by smokers for masking the disagreeable smell of the breath.—*Journal de Pharmacie.*

MODE OF PROTECTING WORKMEN FROM THE EFFECTS OF LEAD.

BY M. MEILLET.

A tinned iron mask is fitted to the face, and a cylindrical tube is attached to it opposite to the nose and mouth ; in the interior of the tube there is a metallic net-work, above which is a fine sponge saturated with a very dilute solution of hydrosulphate of soda. The sponge is so placed as entirely to fill the cylinder ; it is fixed by means of a cover also furnished with a metallic network ; the air being thus compelled to traverse a body saturated with a liquid, which decomposes the salts of lead. All the lead vapours remain behind in the state of sulphuret. This salt is slowly and uniformly decomposed by the carbonic acid, which is always abundantly present in these manufactories. The workman thus respires throughout the day an extremely small quantity of sulphuretted hydrogen, which of all substances neutralises the effects of lead most effectually. M. Meillet also recommends that the hands should be well rubbed with an ointment, containing thirty grammes of hydrosulphate of soda to a pound of lead ; the hands then wiped. These means have been tried by the advice of M. Meillet in many shot manufactories, and the results have been most satisfactory.—*Gazette Médicale*, and *Bulletin de la Société de Medicine de Poitiers.*

CONFESSIONS OF A DOCTRESS.

"At an inquest held in Carey-street, Lincoln's-inn-fields, on the body of Mary Hoskins, who had died of cancer, the following evidence was given by the doctress who had attended the case:—Elizabeth Burnett examined—I live in Russell-court, Drury-lane, and am a doctress and a botanist. I attended deceased for the last twelve months for a cancer. I administered to her sweet herbs, knotted marjoram, hyssop, thyme, sweet marjoram, herbagrass, and things of that 'ere sort. *The Coroner*—What do you receive for your attendance, my good woman ? *The Doctress*—It depends ; some-

Painted by H.P.Briggs R.A.

Engraved by H.C.Shenton.

WILLIAM ALLEN, F.R.S.

First President

OF THE

Pharmaceutical Society of Great Britain.

times sixpence, sometimes a shilling, according to circumstances. *The Coroner*—Then you have no fixed charge? *The Doctress*—Sartinly, tenpence is my reglars; my reglar fee, I means. *The Coroner*—I think you should be cautious about prescribing and demanding a regular fee; you may run foul both of Newgate and the Apothecaries' Hall. *The Doctress*—I should not like to do that, for the one place is as bad as t'other. *A Juror*—Then you mean to say your medicine is sweet and pleasant, like wine? *Doctress*—I do, Sir. *The Juror*—Then, my dear, you shall always prescribe for me. One of the medical gentlemen present asked what sort of cancer was it? *The Doctress*—It was a stone cancer, Sir. *The Medical Gentleman*—You mean to tell us you use nothing from the chemist? *The Doctress*—Forbid! I should use anything from them pison-shops; I never uses no kind of medical medicines; my remedies be sweet and simple ones. *A Juror*—Does your medicine contain any portion of Holloway's ointment? *The Doctress*—No, Sir; I gets all my things in Clare-market, without the trouble of going to Holloway or Hornsey for them. I repeats, I uses no medicines whatsomever, only my own sweets and simples, and herbs. *A Juror*—Madam, will you oblige us with your card? *The Doctress*—Sir, I tell you again, I'm a doctress, and give my patients no cards, nothing but sweets and simples. The jury said they were quite satisfied, and recorded a verdict of "natural death." We understand that the doctress is not a solitary specimen of the species—that they abound in the metropolis, and make a good living of their sweets and simples."—*Globe*.

THE PORTRAIT OF WILLIAM ALLEN, F.R.S.

The Editor of this journal being desirous that the Pharmaceutical Society should possess a Portrait of its first President, prevailed on him to sit to the late H. P. Briggs, R.A., who consented to paint the picture at his own risk, leaving the Society at liberty to purchase it at any future time. The picture was scarcely completed at the time of the decease of the President, which was soon followed by the decease of Mr. Briggs. In the month of June, 1844, the portrait was offered to the Society at the price of 120 guineas, and a subscription was opened; but the number of subscribers was so small that in two months it was withdrawn, and the subscriptions returned to the few who had paid. The portrait being under the control of the Editor, as executor of the late Mr. Briggs, another effort is now made to accomplish the object for which it was painted.

A line engraving of the picture has been executed by Mr. Shenton, and impressions are offered to the members of the Society on the terms mentioned in the advertisement inserted in this number. The amount received after the actual expenses of the engraving are paid, will be appropriated to the purchase of the picture, and if there should be any surplus, it will be added to the Benevolent Fund.

Subscribers are requested to forward their names to the Editor, or to Mr. Churchill; but not to forward the amount until they receive a circular stating that the prints are ready for delivery, which cannot be the case until it is known how many proofs will be required.

The style of the portrait is shown in the frontispiece of this number, which is only a portion of the engraving obtained from an electrotype impression, and comprising merely the bust, while the complete engraving represents the President seated at a table, on which are some proofs of the diploma of the Society.

MODE OF FIXING PENCIL DRAWINGS.

We have received the following instructions on this subject from Mr. Christie, of Westmoreland Place, City Road:—

Dissolve pale resin in spirit of wine; lay the pencil drawing on its face upon a sheet of clean paper, and brush the back of the drawing with the solution. This penetrates through the paper in a few minutes, and as the spirit evaporates the resin is deposited as a varnish on the drawing. This has the advantage of not cockling the paper, which aqueous solutions will do, and as the brush only passes over the back of the drawing, none of the pencil marks are in any degree removed. This process will not answer with drawings on card, or any other substance too thick to be penetrated by the solution. In this case, a weak solution of isinglass may be placed in a shallow dish, the drawing being passed through it so as to wet every part without touching it with a brush.

[We can recommend the above processes in the cases alluded to, and agree with our Correspondent in thinking that the use of a brush is objectionable. For delicate drawings no method is better than the one we have already mentioned, of preparing the paper previously with a coating of size and inverting it over steam when the drawing is finished, as well as during the process when requisite.—Ed.]

ANNOYANCE JURIES.

During the past month an annoyance jury called at the shop of a Chemist in London to examine the weights and scales; one of the gentlemen taking up a ʒij. weight enquired whether it was avoirdupois weight, and objected that it had not the Westminster stamp. He was informed that it was Apothecaries' weight, used for prescriptions, and not for retailing medicines. He took up several other Apothecaries' weights, asking the same question, and appeared unacquainted with that kind of weights. The jury, on leaving the shop, gave strict orders to have all the weights as well as the scales carefully examined. We mention the circumstance for the purpose of advising our brethren to take this precaution. It is a good plan to contract with a scale-maker for the examination of weights and scales at certain periods. The wear and tear of weights, and consequent loss of substance, is so considerable, that this periodical examination is absolutely necessary in order to ensure accuracy, and the expense is trifling compared to the importance of guarding against accidents, and avoiding the exposure of neglect by the annoyance juries, whose visits are at uncertain periods, and who are empowered to enforce the law, although they may sometimes, as in the case above mentioned, be imperfectly acquainted with the subject.

TO CORRESPONDENTS.

"Juvenis."—The salt named *chloride of barium* in the London Pharmacopœia, is denominated *muriate of baryta* in the Edinburgh Pharmacopœia. The former name is generally adopted by scientific Chemists, the salt being considered a compound of barium and chlorine, and not of baryta and hydrochloric acid. The same opinion is also generally entertained with reference to its constitution when in solution.

M.—Camphine spirit is rectified oil of turpentine, wholly deprived of resin. Caustic potash is sometimes used in rectifying it. It becomes unfit for use after being long exposed to the air from partial oxidation and formation of the resin.

ʒj.—(1.) When *Acidum Hydrocyanicum* is ordered in a prescription, the *Acid. Hydrocyanic. Dil.* of the London Pharmacopœia should be used, unless instructions to the contrary be given by the prescriber. Anhydrous Hydrocyanic Acid is never dispensed, nor could it be kept for more than a few hours without undergoing decomposition.—(2.) There is a formula in the Edinburgh and in the Dublin Pharmacopœia for Syrupus Violæ.

O.C.—We understand *Coch. infant*, *Cochleare infantis*, or *child's spoonful*, to mean a dessert spoonful.

B. B. B.—Respecting the gelatinization of tincture of kino, we are unable to add anything to the information contained in a paper by Mr. Redwood, vol. i., p. 399.

R.S., M.P.S.—For the mode of preparation and medicinal properties of Donovan's Liquor Hydriodatis Arsenici et Hydrargyri, see vol. ii., pp. 469 and 546.

W. C.—Bdellium is generally considered to be the produce of *Amyris commiphora*. It is a gum resin frequently found in chests of myrrh, and when the myrrh is not carefully sorted it is probable that both go to the mill together. We are not aware of any other purpose to which it is applied. For fuller particulars, see Pereira's *Elements of Materia Medica*, p. 1684.

W. B.—Dupuytren recommended for promoting the growth of hair an ointment containing tincture of cantharides.

Κεφαλή.—(1.) For the means of purifying nitric and hydrochloric acids, see vol. ii., p. 355, and vol. iv., p. 520.—(2.) The word *alkali* is said to be derived from *al* and *kali*, signifying kali, the plant from which it was originally prepared.—(3.) An Apprentice has to pass the minor examination on becoming an Associate; see vol. ii., No. 8.—(4.) Asbestos would not answer so well as platinum in the case mentioned.

A.P.S.—(1.) The thickness of cream varies according to the temperature of the milk while it is rising. Devonshire cream, which is as thick as butter, is made at a temperature of from 90° to 100°, the pan being kept over a hot plate, or slow charcoal fire. We can give no information respecting the method by which cream is made in London.—(2). Selecta è Prescriptis.—(3). Sal ammoniac dissolved in vinegar, ʒj to ℥ij.

"A Member" (Peterborough).—We regret that we are unable to solve the difficulties alluded to in the process of brewing for want of practical experience.

"A CHEMIST."—A semi-transparent pomatum may be made by dissolving spermaceti in oil, regulating the proportions by the consistence required, and allowing it to cool gradually without stirring.

JOHN LINNEY, M.D.—We sent an answer by post and it was returned.

"AN APPRENTICE (Exeter).—We have not space to give all the details required respecting a Pharmaceutical Education; but advise our Correspondent to enter as a practical pupil in the Laboratory of the Society.

D.—An Ex-Associate can be re-admitted on payment of arrears, or may be admitted *de novo*, on passing the minor examination.

J. B. D.—We are unable at present to detail the provisions which it may be found desirable to introduce in the Act of Parliament for the regulation of Pharmacy; but no act of the kind would be retrospective in its operation.

S. R.—K.—"A MEMBER."—Q.—No law exists to prevent Chemists being drawn for the militia. The subject of juries has not escaped our notice.

"INQUISITOR."—Gmelin's *Handbuch der Chemie* is not translated into English. We are not acquainted with any English work which exactly corresponds with it. Brande's *Manual of Chemistry* and Graham's *Elements*, are among the most complete. Fownes's *Manual* is a very good one for its size, but is rather more elementary.

"JALAPINE."—We have never heard that the College of Physicians is likely to publish a Dispensatory. We have already stated all that we know respecting the Pharmacopœia now in course of preparation.

"AN ASSOCIATE" wishes us to recommend a good treatise on a subject of which we are ignorant, and wish to remain so.

"AN ASSOCIATE."—Pereira's *Materia Medica*, price £2 10*s*.—(2). It is optional.—(3). It is a useful book.

T. A. B.—The question cannot be satisfactorily answered without experiment, which our Correspondent should make for himself. If any thing interesting should result, he may communicate it to us for publication.

G. G.—(1.) Unguentum Hydrargyri Nitratis.—(2.) A little book has recently been published by Dr. Riadore, *On the Medicinal Use of Nitrous Oxide and other Gases:* several works have appeared on the Medicinal Application of Galvanism, among others one by M. Le Beaume.

We have received a new and very complete *Catalogue of Chemical Apparatus, &c.*, from Mr. Button, of Holborn, one of the authors of the Chemical Labels noticed in a former number.

We receive regularly the *British American Journal of Medical and Physical Science*, printed at Montreal; and should be glad to send our journal in exchange, if the Editors would inform us by what channel to forward it.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to THE EDITOR, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. IX.—MARCH 1st, 1846.

FREE TRADE IN MEDICINES.

THERE are few topics which give rise to more discussion among politicians than the tendency of restrictions, or what is termed protection in commerce. While some persons contend that the control of the legislature in such matters is necessary in order to preserve a just equilibrium, and protect vested interests, others assert that this interference cripples individual exertion, checks the prosperity of commerce in general, and thus injures the public. It is not our intention to discuss the merits of this intricate question, but we advert to it for the purpose of pointing out the fallacy of a notion which we have heard expressed; namely, that the present is an unfavourable time for attempting to introduce legislation with reference to Pharmacy, because the tendency of the age is rather to remove restrictions than to interfere with "the liberty of the subject" in commercial matters.

The sale of medicines in this country is an illustration of free trade to the utmost possible extent, and the legislation which we advocate consists in obliging those who perform this office to fulfil certain conditions; consequently such legislation would in one respect interfere with the unlimited freedom which now exists. But the question is entirely distinct from that of free trade in corn or other ordinary merchandize, inasmuch as the interference proposed is not in fact a restriction on trade, but a restriction on ignorance. It is not our object to create a monopoly, and to limit the number of Pharmaceutical Chemists, but to oblige those who embark in the business to possess the needful qualification. In the first instance, this might for a short time operate as a check on the number of adventurers in the field, as the necessity of education would shut out incompetent persons from the privilege of commencing business. But it would not limit the number of competent Chemists, and in the course of a few years the body would enjoy a higher position on account of the improved education introduced by law; and this would induce a superior class of men to join the ranks, amply providing for all the wants of the public. We are not therefore considering a fiscal or commercial question, affecting the revenue of the nation or the consumption of commodities. The sale of drugs would be as free and unlimited under the new system as it is at present; but it would be in more competent hands, and the regular Chemists and Druggists would become by law a distinct body, instead of being, as they now are, associated in the public mind with persons possessing no qualification except the coloured show-bottles.

The creation of this distinction is no more than an act of justice to those who are entitled by their education to the confidence of the public; and the existence of the distinction would be quite as advantageous to the public at large as to the Chemists themselves.

The remedies employed for the relief of disease are weapons of life or death, according to the skill and accuracy with which they are administered. It would, therefore, be an insult to common sense to attempt to prove, that a competent knowledge of their nature and properties is absolutely necessary in Dispensers of Medicine. In all cases in which life and health are concerned, it is the duty of the Legislature to take every practicable precaution for the security of the public. This duty is quite as important as the protection of commercial interests, with which, in the present instance, it would not interfere. As we observed in our last number, the law which enforces the education of Physicians is nugatory so long as it is not extended equally to those who prepare the prescriptions; and the removal of this inconsistency is all that we claim on behalf of our body. We inadvertently included Surgeons in the above observation (page 338), which is not strictly correct, as there is no Act of Parliament enforcing the powers of the College, although the authority of the Charter, backed by public opinion, is in effect almost equivalent to an Act.

THE PROPER FUNCTIONS OF A COLLEGE OF PHARMACY.

The establishment, by Act of Parliament, of a College of Pharmacy having authority to examine and register all future Chemists and Druggists, would be the most simple and effectual means of bringing to completion the objects for which our body has been striving during the last five years; and this could be accomplished either by creating a new institution, or by conferring on one already in existence the authority of an Act of Parliament.

The Pharmaceutical Society was instituted with a view to this ultimate result, and its operations have been directed in such a manner as to prepare our body for the responsible duty of self-government. But being a voluntary association, the powers which it enjoys under its Charter of Incorporation are much more limited than those of an Act of Parliament; and at the same time its functions, although adapted for a corporate body, are in some respects incompatible with the enlarged powers belonging to a legal enactment.

It will therefore be necessary either to restrict the operations of the Society, in some respects, or to create a new College possessing the requisite powers.

To explain the comparative merits of these two alternatives, we need only advert to the original constitution of the Society, and point out the kind of modifications which would be required in order to comply with the recognised principles upon which Parliamentary powers are conferred on institutions of this description.

The Pharmaceutical Society was instituted for the purpose of uniting the Chemists and Druggists of this country into an ostensible and recognised body—for the protection of their general interests—for the advancement of the art and science of Pharmacy, and the creation of a Benevolent Fund. The first of these objects—namely, the union of the members of our body, is compatible either with the privileges of a Charter or the powers of an Act; but this union, which has been as extensive as we could expect under the voluntary system, is not complete, nor is it likely to extend to all the parties concerned, unless sanctioned by legislative authority.

The most effectual, although an indirect method, of advancing the art and science of Pharmacy consists in the establishment of an examination for Pharmaceutical Chemists; and the Charter of the Society provides, that all future Chemists who may join it, either as Members or Associates, shall, prior to their admission, pass an examination. But at the time that the Pharmaceutical Society was founded, no school existed in this country which was adapted especially for the education of Students in Pharmacy; and in order to give due effect to the examination, it was necessary to establish a school as a type of the kind of institution required for preparing the candidates for the ordeal to which they must submit. A school was therefore founded in the metropolis, as well as branch schools in some of the large provincial towns.

In this respect the constitution of the Society is incompatible with the acknowledged principles upon which an Act of Parliament could be granted, since it is both an educating and an examining body. As a voluntary Association it may properly exercise these two functions, both of which are in accordance with its most important object—the advancement of the art and science of Pharmacy. The Society is chiefly supported by annual contributions, no fees are claimed from the candidates on examination, and the school, instead of realizing a profit, does not pay its expenses.

If an examination were instituted by Act of Parliament, fees would be required from the candidates; these fees would constitute the funds of the College, and would be appropriated to the discharge of its needful expenditure. In this case, the examination being compulsory, the demand for Pharmaceutical education would naturally give rise to the establishment of Schools of Pharmacy, and the Examining College, if allowed to exercise educational functions, would enjoy a kind of monopoly in this respect, as it would have the power of making regulations in favour of its own school.

The London University, in Gower Street, was originally intended as a College for granting degrees, as well as for educational purposes. When application was made for a charter, it was decided that one of these offices must be relinquished, and the founders accepted a charter as an educational body, resigning the granting of degrees to the University of London, which was created for that purpose, the name of the original University being changed to University College for the sake of distinction.

In the case of the PHARMACEUTICAL SOCIETY, there are two modes in which the difficulty may be surmounted without prejudice to any of the objects enumerated in our charter: first, the Society, becoming a College of Pharmacy and the examining body with powers to carry out its provisions effectually, may abandon the school, leaving the education to be conducted by other associations or in private establishments; or, secondly, the PHARMACEUTICAL SOCIETY may continue to be an educating body, resigning the office of examination to a New College, constituted on representative principles, and comprising all the Chemists already in business as its original members. We are inclined to think that the latter arrangement would be preferable, as the Benevolent Fund would continue to belong to the original body, instead of being dependent for support on the examination fees, the propriety of which might be called in question. The school would also continue to be carried on under the existing Charter of Incorporation, which would be a decided advantage.

At the same time the two Institutions would be entirely disconnected, each performing its own functions, and mutually promoting the advancement of the Art and Science of Pharmacy. This plan would be in accordance with the principles adopted by the Physicians. The College of Physicians is an examining body, empowered by Act of Parliament to grant degrees in medicine. Many of the Fellows and Members of the College are in their individual capacity connected with Medical Schools at the Hospitals, some of which are incorporated by Royal Charter. These schools are quite independent of the College of Physicians, which has no official control or influence over them.

We are not prepared at present to give a positive opinion as to the course which it will be advisable for the PHARMACEUTICAL SOCIETY to pursue, as the subject is under the consideration of the Council, and must be further discussed before any specific plan can be proposed. We hope to be able in our next number to give more definite information respecting the proceedings; and in the mean time merely state in general terms the leading features of the case for the consideration of our readers. In looking back at the labours of the PHARMACEUTICAL SOCIETY since its formation, we are confirmed in the belief that all the measures adopted have tended to promote the grand object in view; namely, the union of all the Chemists of this country into a recognised body, and the introduction of an efficient system of education and examination. It would be easy to prove to the satisfaction of a Parliamentary Committee, that such regulations are demanded for the safety and welfare of the public, and that the PHARMACEUTICAL SOCIETY, even as a voluntary association, has laid the foundation for the desired reform, from which it may be inferred that for its completion nothing is required but an Act of Parliament.

THE LEICESTERSHIRE ASSOCIATION OF CHEMISTS AND DRUGGISTS.

THIS Association was formed in November, 1845, for the purpose of encouraging a friendly feeling among the members, and establishing a fair and uniform rate of charges. We have received a copy of the regulations, from which the following are extracted, being the most important :—

"That a general meeting of the members be held quarterly, for the purpose of interesting and scientific discussion, and other matters of business.

"That a committee of ten members and a secretary be chosen annually, for the purpose of transacting the business of the Association, five of whom shall be a quorum.

"That an annual subscription of five shillings be paid by each member towards defraying the necessary expences; such payment to be made at the first quarterly meeting in each year.

"That all subscriptions and fines be paid to the secretary, and that the Committee shall meet in the first week in each month, for the purpose of adjusting the prices, &c.

"That a uniform price-book be adopted by each member, in which the retail prices shall be entered as fixed by the Committee, which will be altered from time to time as may be found necessary.

"That a private mark be adopted by the Association, and all prescriptions and recipes, whether in Latin or English, shall, on being first presented or compounded, have such mark attached thereto, which price shall be considered binding by all future compounders.

"That the prices fixed by the Committee shall not extend to the wholesale, nor to articles sold to persons using the same in their trade."

A fine is imposed on those who deviate from the prescribed standard of prices, and each member, on his admission, signs an undertaking to abide by the regulations of the Association in this respect. In order to facilitate this latter object, the Association has published a price-book (edited by Mr. Goddard, one of the Committee) of which we have given a notice in this number.

We are always glad to see a disposition among our brethren to unite in a friendly spirit, and by establishing periodical meetings, to discourage the jealousy which sometimes exists among followers of the same occupation. Although this Association is not designated "a branch of the Pharmaceutical Society," one of its objects is, as Mr. Goddard informs us, to promote the national effort to unite the Chemists and Druggists of Great Britain into one body. We hope the Association will continue to thrive, and believe that so long as the present good feeling prevails among its members, the means adopted for insuring uniformity in prices will be found advantageous. It cannot be denied that the "cutting system" is highly injurious, and the interests of the public are best secured by a fair and uniform charge. We have never advocated this kind of arrangement in the Pharmaceutical Society, thinking it more adapted for local than general regulation. Where such measures are found practicable, they cannot fail to produce a good effect, but absolute unanimity is necessary to insure complete success.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

SUPPLEMENTARY LIST
OF
MEMBERS AND ASSOCIATES OF THE PHARMACEUTICAL SOCIETY,
ADMITTED SINCE THE YEAR 1842.

The Members distinguished by an * were "Founders" of the Society, having been Associates at its commencement, and admitted as Members since 1842.

HONORARY MEMBERS.

London	George Fownes, F.R.S.
Bristol	William Herepath, Esq.

MEMBERS.

Abergavenny	Ackrill, George, High Street
	*Hurst, Wm. T. H., Neville Street
Abingdon	Ballard, Charles
	Goldsmith, John, Market Place
Agra, E. I.	Hulse, Thomas
Alford	Reed, Eardley, West Street
Alnwick	*Athey, Joseph, Bondgate Street
Alton	Hardwicke, Joseph, High Street
Ashburton	*Herron, Fred. Wm., West Street
Ashby de la Zouch	Redfern, John, Market Place
Aylesbury	Dickins, Rowland, Kingsbury Street
Aylsham	Bane, William, Market Place
	Symonds, John, Market Place
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	Stocken, John, High Street
Banbury	Austin, James Battle, Parson's Street
	Ball, George Vincent, Parson's Street
	Molesworth, William F., High Street
Bangor	Williams, Richard Jones, Waterloo Place
Barnet	Morse, John, High Street
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Bath	Edden, John, 11, George Street
	Eve, Henry, 13, Cheap Street
	Hayward, Wm. Griffin, 13, Northgate St.
	Mackay, John, 8, London Street
	Maggs, Thomas Charles, Bartlett Street
	Pooley, John Carpenter, 8, George Street

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BEVERLEY . . .	*Dykes, Thomas, Toll Gravel
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	Jones, James, Argyle Street
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	Corfield, Charles, 11, New Street
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BLACKBURN . .	Baines, Richard, King Street
	Cort, John, Northgate Street
	Graham, Thomas Ashcroft, Darwen Street
	Pickup, Thomas Hartley, Salford
	Slater, William Boocock, King Street
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BOLTON	Green, George
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	*Cockshott, Joseph, Westgate
	Hick, Joseph, 2, Broadstone Street
	Pratt, John, Ive Gate
	Robinson, William B., Tyrrell Street
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BRENTFORD . . .	Farrant, John Gatchell, High Street
	Smyth, George Frederick, High Street
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BRIDLINGTON . .	*Cooper, Mark Ward, High Street
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BRIGHTON . . .	Allen, William, Prince Albert Street
	Heath, George, 5, St. James' Street
	Payne, William White, 13, North Street
	*Steele, Stephen, St. James' Street
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	Freestone, Thomas Morris, 3, Bedminster Causeway
	Nicholls, Wm. Brooks, 3, Lower Berkley Crescent
	Pearce, George, 28, Park Street
	Schacht, George Fred., 3, Regent Place
	Sprackett, George, 15, Wine Street
	Taplin, Joseph, 13, Corn Street

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	Cayme, W. G., Beach
Brompton	Death, John William, High Street
Bromyard	Philpott, John, Market Place
Bungay	Owles, James
Burley	Holden, James, Elm Tree Place
Burnley	Cowgill, Brian, Manchester Road
	Rosser, Walter, St. James' Street
	Smallpage, Isaiah, St. James' Street
	Thomas Richard, Market Street
Burslem	Blackshaw, Thomas, St. John's Square
	Goodwin, Owen, Waterloo Road
Bury	Howarth, James, Fleet Street
Bury St. Edmunds	Moor, Joseph, Abbeygate Street
	Nunn, John Vincent, Abbeygate Street
Caernarvon	*Owen, Griffith, High Street
Callington	Hornabrook, Richard, Fore Street
Calne	Cole, Charles Edward, High Street
Cambridge	Deck, Isaiah, King's Parade
Canterbury	*Cowell, Silas, St. George's Street
	Wilson, Joseph, 8, High Street
Carmarthen	Smith, John, 57, King Street
	Williams, John Edward
Chelmsford	Moxon, James, High Street
	Reeve, William, High Street
Cheltenham	Hammond, William, Bath Street
	*Malpas, Francis, 5, Promenade Villas
	Shrimpton, Charles, 337, High Street
Cheshunt	Ashby, Charles E., Turner's Hill
Chester	Baker, James Barry, Eastgate Street
	Bowers Henry, R., Eastgate Street
	Broady, Thomas, 138, Bridge Street
	*Higgins, William, 142, Upper Bridge St.
	Williams, Joseph, Foregate Street
Chipping Norton	Beesley, Thomas, Market Place
Chipping Ongar	Stevens, Alfred, Roden House
Christchurch	Jenkins, Henry Maine, Bridge Street
Church	Sefton, Abraham, Henry Street
Cirencester	Knight, Alfred
Clapton	Thompson, Henry A., 2, Belle Vue Terrace
Coggeshall	Oliver, William Lemon (*Life Member*) Church Street
Collumpton	*Manley, Henry, Fore Street
Cottingham	Lister, George, Hall Gate
Crediton	Searle, William, High Street
Crewe	Thomas Edward George

CUCKFIELD	Newington, Henry Plaisted, Church Street
DARLINGTON	Abbott, John Thomas
DEMERARA	Driver, Gustave Theodore
	Knowles, Richard John
	McAra, James
	Stewart, F. H. (*Life Member*)
DEPTFORD	Lockyer, George, Flagon Row
	Strong, William Frederick, High Street
	Summers, Samuel, High Street
DERBY	Hassall, John Thomas, 4, Victoria Street
DOVER	Foster, Robert, Castle Street
	Sells, Robert, King Street
DOWNTON	Clare, Richard Tindal
DRIFFIELD	Knowsley, Robert, Exchange Street
DUDLEY	Clarke, Charles Francis Geo., Queen Street
	Dennison, Matthew, High Street
DUNFERMLINE	Brown, William, 5, South Chapel Street
DURHAM	Jerrems, John, 2, South Street
ECCLES	Brown, John, Church Street
EGHAM	Nightingale, Henry Lewis, High Street
ENFIELD	McLeod, Alexander, Silver Street
EPSOM	Keeling, George Ratcliffe, High Street
EVESHAM	Kinsey, William Selkirk, Bridge Street
EXETER	Cole, William, H., Waterbeer Street
	Hodgson, Richard, 97, Fore Street
	Husband, Matthew, Waterbeer Street
	Wheaton, Frederick, North Street
FAKENHAM	Notcutt, William L., Oak Street
FOLKESTONE	Davies, John Oliver, High Street
FULHAM	Main, William
	Vincent, Philip, 3, Frederick Place
GLOUCESTER	Baines, John, Norfolk Street
	Matthews, Edwin Richard, Lower Northgate Street
GRANTHAM	Avery, Robert, High Street
GRAVESEND	Holmes, Thomas, 83, High Street
	Spencer, Charles, 21, High Street
GREENWICH	Medwin, Aaron, 3, Blackheath Road
GUERNSEY	Gale, Samuel, St. Sampson's
GUILDFORD	Wheeler, Robert, 120, High Street
HAMMERSMITH	Gitsham, William, King Street
HAMPSTEAD	Watts, William, High Street
	Willing, George F. B., East Street
HARTLEY ROW	Newman, Thomas
HAVANT	White, George, West Street
HAVERFORDWEST	Saunders, David Price, Bridge Street

HELSTON . . .	Guy, Guy, Coinage Hall
HEREFORD . . .	Goode, Thomas, High Town
	Hughes, William Parbury
	Williams, Walter, Wye Bridge Street
HEYWOOD . . .	Bamford, Edmund, Market Place
	Jameson, Joseph, Bridge Street
	Sagar, Stephen Carr, Market Place
HOLMFIRTH . . .	Dyson, Thomas, Beeley's Buildings
HOLYWELL . . .	Jones, John, High Street
HORNCASTLE . .	Elsey, John, Market Place
HORSHAM . . .	Neeves, Benjamin
HUDDERSFIELD .	England, William Paul (*Life Member*), Market Place
HULL	Crompton, Jonathan, C., 5, Prospect Street
	Foster, James Fawcett, Queen Street
	Healey, Samuel George, 18, Lowgate
	Lloyd, James Sidden, 61, Whitefriar Gate
	*Reinhardt, Johaan, C., 22, Market Place
	Simpson, John, Whitefriar Gate
	Wallis, Ebenezer, Myton Gate
HUNSLET	Williamson, James, Chapel Street
IPSWICH	Hayward, Edward, Brook Street
	Wiggin, John, St. Matthew Street
KENDAL	Severs, Joseph, Stricklandgate
KENILWORTH . .	*Lowe, Edward, High Street
KIDDERMINSTER .	Hodgkinson, William, Vicar Street
LANCASTER . . .	Jackson, Edmund, 20, Upper King Street
	Ross, Stephen, Cheapside
LAUNCESTON. . .	Spettigue, William, Southgate Street
LEAMINGTON . .	Deck, Isaiah, 6, Victoria Terrace
	Jones, Samuel Urwick
	Powell, Thomas William, Wellington Street
LEEDS	Macgowan, John Tinker, 141, Woodhouse Lane
LEEK	Pickford, Edwin, Market Place
LEICESTER . . .	Clark, John Webster, Granby Street
	Palmer, Thomas William, Market Street
	Slade, Daniel Davis, East Gates
	Teear, George, Humberstone Gate
	Woodward, Thomas, Haymarket
LEIGH	Pogmore, John
LEWES	Martin, Silas John, 16, High Street
	Martin, Thomas, 16, High Street
LINCOLN	Collins, Charles Francis, High Street
	Tomlinson, Charles K., 292, High Street
LICHFIELD . . .	[illegible], Robert, Tamworth Street

Liverpool . . .	Anderson, Arthur, 69, Byron Street
	Bowers, Thomas, 16, Redcross Street
	Broome Robert
	Cleworth, James, Anson Street
	Higgins, Charles
	Jardine, Edward, 36, Orford Street
	Venables, Joseph H., Brownlow Hill
	Watts, Edward
Lyme Regis . .	Marder, James Wood

LONDON.

Allen, Arthur . . .	22, Holles Street, Cavendish Square
Allen, George . . .	7, Cowper Street
Ambrose, Thomas . .	Bethnal Green
Badcock, John . . .	Holloway Road
Ball, Thomas Mugliston	27, St. George's Road
*Barclay John. . . .	55, Fore Street
Barkley, Thomas . .	15, Little Tower Street
Bastick, William . . .	2, Brook Street
Bellingham, Robert . .	Strand
*Blake, Charles Titcomb	Piccadilly
Boys, George	2, Barnsbury Street
Bryant, John	Savage Gardens, Tower Hill
*Bryant, John. . . .	32, Upper Belgrave Place
Burden, Edward . . .	38, Duke Street
Burnidge, Edwin . . .	119, Albany Street
Carne, Charles . . .	Caledonian Road
Carrick, James . . .	Duke Street
Clarke, Benjamin . .	Mare Street, Hackney
Coward, George William	10, Norfolk Street
*Collins, John Richard .	120, Crawford Street
*Cracknell, Charles . .	106, Edgware Road
Cripps, James . . .	154, Sloane Street
Cross, Henry	36, Horseferry Road.
Davies, Henry Edward .	43, Wood Street
Delatouche, William .	147, Strand
Drage, Charles . . .	30, Duke Street
Eade, George . . .	39, Goswell Street
Floar, John	27, Bishopsgate Street
Freeman, Robert (*Life Member*)	38, High Street, Kensington
Garden, Felix R., . .	372, Oxford Street
Garrard, Arnold Finchett	Holloway Road
Gill, George Wadman .	25, Princes Street
*Grounds, David . . .	49, Threadneedle Street

Hadfield, Joseph R.	326, High Holborn
Hadfield, Thomas R.	
Haliday, William Robert	37, Leadenhall Street
Hemmingway, Alexander	Portman Street
Hemmingway, Walter	
Hooper, Thomas Woodyatt	5, Bathurst Street
Jeynes, George William	42, Princess Street, Edgware Road
Jones, William	Charing Cross
*Kennett, George Bagot	29, Haymarket
Lamacroft, William	49, Princes Street, Leicester
*Linder, Charles	104, Strand
Lloyd, Arthur	68, Fleet Street
McLacklan, James	42, Whitechapel Road
Massa, William	2, Ranelagh Terrace, Pimlico
Mawby, William	68, Fleet Street
Metcalfe, Tristram W.	16, Crown Street, Walworth
*Miller, Charles Bayfield	15, Cheyne Walk, Chelsea
Morison, Alexander Waugh	1, Walton Place, Brompton
Moreton, George	
Mowbray, George N.	36, Paternoster Row
Orridge, Robert	22, Ludgate Hill
*Pattison, Thomas Septimus	29, Lloyd's Square
Peppin, Sydenham H.	25, Princes Street
Penrose, Arthur W. (*Life Member*)	7, Amwell Street
Pinder, Edward	Camden Town
Plummer, George	High Street, Peckham
Potts, John	55, South Audley Street
Pratt, Edward	25, Coventry Street
Richardson, George	12, Morland Place, Notting Hill
Richardson, Frederick A.	76, Earl Street, Lisson Grove
Roach, Pope	210, High Street, Southwark
Sandford, George Webb	47, Piccadilly
Sandford, Richard	17, White Horse Lane, Stepney
Sharpe, George Young	Islington Green
Sharpe, Marmaduke L.	10, Mount Row, Liverpool Road
*Shirley, John George	97, High Street, Marylebone
Solly, Stephen Francis	3, St. George's Circus
Swanwick, Francis	9, Commercial Place, North Brixton
Waller, Arthur	1, Bedford Street
Walker, Edward Glenton	42, Tothill Street
Ward, Francis	14, Grosvenor Street, West
Warin, James	41, Blackmoor Street
Warner, Charles Heath	55, Fore Street
Wayling, George Chaplin	80, Albany Street
Whiffin, Henry	80, Albany Street

Willmott, William . .	83, High Street, Southwark
*Winstanley, Henry Geo.	7, Poultry

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	Smallwood, John, W., Mill Street
	Wright, George Warren, Chestergate
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	Taylor, Clement, Gabriel Hill
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	Howorth, James, 2, Bridge Street
	Phillips, Robert
	Reddish, John
	Talbot, John Hind, Ancoat's Street
	White, John Haines, 111, Oxford Street
	Wylde, James, 105, Stretford New Road
	Wylde, John, 64, Brook Street
MANSFIELD . . .	Sargent, William, Market Place
MARGATE . . .	Gaskell, William, 16, High Street
MARKET HARBRO'	Meadows, John, Victoria Place
MARKET RASEN .	Brett, Samuel Fisher, Queen Street
MASHAM	Kendall, George, Silver Street
MELTON MOWBRAY	Wright, Charles, Corn Hill
MIDDLETON, LANCASTER . . .	Hughes, John, Market Place
MIDDLETON, IN TEESDALE . . .	Marsden, Joseph
MIDSOMER NORTON	Dudden, Richard Mogg
MODBURY . . .	Cornish, William, Church Street
MONTGOMERY . .	Owen, David, Broad Street
MONTREAL, N. A. .	Rexford, Richard W.
MORICE TOWN . .	*Singleton, John, Morice Place
MORTLAKE . . .	Morse, George (*Life Member*)
NAPLES	Kernot, Joseph, Strada, San Carlos
	Kernot, Septimus, Strada, San Carlos
NEATH	French, Paul Evans, New Street
NEWARK	Harvey, John, Stodman Street
NEWBURY . . .	Sainsbury, John, Market Place
NEWCASTLE-UNDER-LYME . . .	*Cartwright, William, Iron Market
	*Heathcote, Thomas Sarl, Red Lion Square
	Turner, Thomas, 40, High Street
NEWCASTLE-ON-TYNE	Fawcett, Benjamin, 91, Pilgrim Street
	Lee, Matthew, Mosley Street
	Maling, William, 42, Grey Street
	Russell, Henry, 57, Groat Market

NEW FERRY	Trumper, Richard
NEWPORT, I. W.	Morris, Maynard, St. James' Square
	Pittis, Samuel
	Wells, Edward George, St. James' Street
NORTHAMPTON	Atterbury, Richard, Regent Square
	Wagstall, John Henry (*Life Member*) Sheep Street
NORWICH	Cooke, William, Saint Giles
	*Fitch, Robert, Market Place
	Harper, George, Bank Plain
	Horsnaill, Charles, London Street
	Howkins, Lionel, Saint Augustine's
	*Smith, Richard Buck, Magdalen Street
NOTTINGHAM	Goodyer, Frederick R., High Street
	Parr, Samuel, Market Place
	Wood, James, Clumber Street
ODIHAM	Hornsby, John Harwood, High Street
OLDHAM	Brelsford, Mark, Greenacre's Moor
	Buckley, Daniel, George Street
	Holt, John
OSWESTRY	Evans, Richard, The Cross
OTLEY	Thompson, Edward, Market Place
OXFORD	Hodgkinson, Henry
	Kent, Edward, Corn Market
PADSTOW	Bryant, James Henry, Duke Street
PAIGNTON	Carnell, Henry Driver, Fore Street
PEEL	Carran, Tho. (*Life Member*) Market Place
PENRITH	Kirkbride, William, Great Dockway
PENZANCE	Cornish, Henry Roberts, Green Market
PETERBOROUGH	Whitwell, John, Long Causeway
PLYMOUTH	Ball, Robert Hawker, Union Road
	Rowe, John, 32, Tavistock Street
PONTEFRACT	Arnall, Thomas, Market Place
	Tinker, Charles James, Market Place
PORTSEA	Dale, William James, 50, Queen Street
	Phillips, William, Bonfire Corner
PRESTON	Sharples, George, 7, Fishergate
RAMSGATE	Morton, Henry, 12, Harbour Street
READING	Miller, Robert P., 51, Market Place
	Shipley, John Jenkins
RETFORD	Welberry, George, Church Gate
RICHMOND, YORK.	Ward, James, Market Place
RIO DE JANEIRO	Sanford, John Robert (*Life Member*) Rua do Hospicio
ROCHDALE	*Dickin, Jos. Pearson, Yorkshire Street
	Holdsworth, George

Romsey	Jones, John
Runcorn	Prescott, John, Church Street
Ruthin	Cotton, Thomas, Clywd Street
Ryde	Ellis, Andrew, 73, Union Street
Salford	Hall, Joseph, 24, Regent Road
Salisbury	Whitlock, Edwin, Market Place
Shaftesbury	Roberts, Geo. Matthews, Market Place
Sheffield	Cockayne, Henry, 22, Angel Street
	Jennings, John E. H., 60, Fargate
	Lofthouse, Thomas, Snig Hill
	Maleham, Henry, West Bar
	Roper, William Greaves, Broad St. Park
	Sewell, James, 75, Broomhall Street
	Sewell, James Clark, 75, Broomhall Street
	Wright, John James, 15, Fargate
Sherston Magna	Richards, Martin
Shields, North	Ramsay, Charles, 1, Linskill Street
Shields, South	Tully, James Emery, 10, King Street
	Walker, John Robinson, Thrift Street
Shrewsbury	Whitney, George, High Street
Sidmouth	Atkinson, John, High Street
Sittingbourne	*Tadman, Peter L., High Street
Slough	Griffith, Richard, Buckingham Palace
Snaith	Coghlan, William, Market Place
Southampton	Barraud, Charles D., 17, Above Bar
	Beedle, Thomas G., 16, Hamilton Terrace
	Davis, Thomas, Bernard Street
	Dowman, George, 160, High Street
	*Randall, William B., 146, High Street
South Molton	Attwater, Alexander H., The Square
Spalding	Millns, Francis, Market Place
Staines	Baker, George, High Street
St. Alban's	Page, John, High Street
St. Austell	Geldard, John, Church Street
	Hern, William H., South Street
St. John's, New Brunswick	Sharpe, John Gilmore
Stockport	Bayley, Francis J.
	Woolley, Daniel, 16, Millgate
Stonehouse	Hambly, George, 79, Union Street
Stourbridge	Morris, Alfred P., High Street
Sunderland	Young, John, High Street
Swaffham	Rogers, Edmund D., Market Place
Swansea	Brend, Thomas, High Street
Sydney	*Fincham, Henry S.
Taunton	*Hammet, John, St. James' Street

Tavistock . . .	*Perry, Solomon, Back Street
Teignmouth . .	Cornelius, Richard B., Regent Place
	Liddon, George, Wellington Row
Tenbury . . .	Slade, Robert, Terne Street
Thaxted . . .	Haslam, Simeon, Town Street
Tickhill . . .	Crowther, Thomas, North Gate Street
Tipton	Williams, John, New Road
Tooting	Medcalf, Ebenezer, High Street
Torquay . . .	Glynn, William, Madeira Place
	*Lodge, Thomas, 28, Higher Union Street
	Weeks, Caleb, Lower Union Street
Trowbridge . .	Mackneil, John, Fore Street
	Young, Uriah, Market Place
Tunbridge . .	Wibmer, Lewis, M., High Street
Tunstall . . .	Edge, William W., High Street
Twickenham . .	Parrott, Augustus F., Church Street
Ventnor . . .	Hawkins, Richard, High Street
Upton-on-Severn	Cooper, William E., High Street
Wakefield . .	Coates, William, West Gate
	Hick, Matthew B., West Gate
Walsall . . .	Mason, Georgius F., High Street
Wandsworth . .	Brooks, Charles, 1, South Ville
	Nind, George, High Street
Wantage . . .	Whitehorn, Thomas, Market Place
Wareham . . .	Leggett, John T., South Street
Warminster . .	Taylor, William H., Market Place
Warwick . . .	Hopkins, Thomas, Old Square
Watchet . . .	Williams, John W.
Welshpool . . .	*Jones, Oliver E., Broad Street
West Malling .	Stedman, Richard B., High Street
Weston-super-Mare	Griffiths, Charles, Sea View House
Weymouth . . .	Barling, Thomas, Thomas East
	East, George, St. Mary's Street
	Groves, Richard
Whittlesea . .	Sanderson, Edward, Old Whittlesea Street
Willenhall . .	*Biddle, Henry, Church Street
Wincanton . .	Phillips, Thomas, Church Street
Winchester . .	Brownjohn, William H., Northgate Terrace
Windsor . . .	Weller, George, 50, High Street
Woodbridge . .	Sterry, Henry W., Thoroughfare
Woolwich . . .	*Fairbank, James H., 23, High Street
	*Green, Robert, Richard Street
Worcester . . .	Musson, Telemachus, G., Cottage Gate
	*Plevy, Henry F., 51, Sidbury Street
Workington . .	Kitchin, John, Wilson Street
Wycombe . . .	Lansdale, Ralph, Queen Street

WYMONDHAM	Skoulding, William, Market Place
YARMOUTH	Goddard, Henry E., Church Plain
	Shingles, George S., Gold Street
	Silvers, Robert, North Quay
YORK	*Cooper, Thomas, Walmgate
	Davison, Ralph, Stonegate
	Glaisby, John, 18, Church Street
	Hurworth, Thomas B., 69, Walmgate
	Tate, John, Fossgate
	White, William, Low Ousegate

MAJOR EXAMINATIONS.[*]

†French, Joseph B.	Chatham
†Hall, John Richards.	Brighton
†Huggins, George Thos.	338, Oxford Street
Johnson, William	Birkenhead
†Paul, Benjamin Horatio	Fakenham
Pinder, Edward	Camden Town
†Rogers, John Robinson	Honiton
Schacht, George Frederick	Clifton
†Sparks, John	19, Southampton Row
Smyth, George Frederick	Brentford
†Teasdale, Thomas Bonner	338, Oxford Street

ASSOCIATES

ADMITTED ON PASSING THE MINOR EXAMINATION.

Allchin, Alfred	West Malling
Boulter, George	29, Haymarket
Bristow, Robert A.	177, Regent Street
Bancroft, John Jones	Mold
Doughty, Thomas	Holloway
Galt, Edwin	Portsmouth
Gibbs, Paul Taylor	198, Oxford Street
Hall, John	Mitchell Dean
Heming, Robert	Margate
Huggins, George Thomas	338, Oxford Street
Humphreys, Henry	2, Queen's Row, Pimlico
Johnson, William	35, Blackman Street
Johnson, William	86, New Bond Street
Lamplough, Henry Thomas	4, William Street, Knightsbridge
Langdon, William	Bampton, Devon
Langford, John	47, Cheapside
McOwan, John Townsend	10, St. George's Place, Liverpool Road

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[*] Those marked thus † are not yet Members, but are eligible for admission without further Examination.

Merrell, James . . .	338, Oxford Street
Nutter, John	Preston
Pearse, Ebenezer . . .	Sherborne
Poctor, William Boston .	27, Cole's Terrace, Islington
Read, Robert	Devizes
Redford, Joseph . . .	Windsor
Richardson, Edward . .	53, Davies Street, Berkeley Square
Richardson, James . .	6, Mount Street, Grosvenor Square
Shrubsole, George William	60, George Street, Portman Square
Stutchbury, Joseph . .	7, Poultry
Suggate, Henry E. . .	20, Bath Street, City Road
Sumpter, William . .	Pembroke Dock, South Wales
Taylor, Richard . . .	69, Lower Marsh, Lambeth
Teasdale, Thomas Bower	300, Oxford Street
Thompson, Richard . .	3, Broad Street, Bloomsbury
Wakefield, Henry . .	23, Great George Street
Whitfield, John . . .	Worcester
Whitney, George . . .	Shrewsbury
Wilkinson, William . .	37, Berners Street
Woolley, George . . .	Maidstone
Wyatt, Alfred	51, Park Street, Grosvenor Square

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Colls, William George	Mr. Nettleship	Leicester
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Moate, Frederick E.	Mr. Pissey	Rayleigh
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Murray, George	Mr. Murray	"
Nall, Thomas M.	Mr. Greaves	Bakewell
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Roberts, Joseph	Mr. Cheetham	Nottingham
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Row, Frederick	Mr. Mabson	Yarmouth
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Sadler, Edward	Mr. Judson	Ripon
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Wallworth, David	Mr. Goode	Congleton
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Warden, Charles	Messrs. Savory & Co.	London
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Watkins, Thomas W.	Mr. Clarke	
Watson, Doctor C.	Mr. Edmondson	Preston
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Williams, Frederick J.	Mr. Taylor	Manchester
Wills, Thomas D.	Mr. Cotton	Barnstaple
Young, Tonkin	Mr. Job	Truro
Youngman, Edward	Mr. Bartlett	Chelsea

[On the 23d of January Mr. Brayley delivered his Second Lecture on Porcelain and Earthenware, and their application to Chemistry and Pharmacy, the abstract of which is deferred until a future number.]

PHARMACEUTICAL MEETING,

FEBRUARY 11, 1846.

MR. SQUIRE IN THE CHAIR.

A paper was read on

THE CULTIVATION OF RHUBARB FOR MEDICINAL USE IN THE NEIGHBOURHOOD OF BANBURY.

BY MR. WM. BIGG.

This paper contained much interesting information, which has been furnished in reply to a list of queries prepared by the Scientific Committee. A long discussion ensued on reading the paper; but as some farther details are required to render the account complete, the publication of the paper is deferred until this additional information has been obtained.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE PROPERTIES OF THE

HIPPOMANE MANCINELLA, OR MANCHINEEL TREE.

BY W. HAMILTON, M.B.

The manchineel is a large handsome spreading tree, with a trunk of from seven to twelve feet or more in height, attaining, with its spreading branches, a total elevation of about thirty feet. It is found, I believe invariably, on the sea-shore, forming a beautiful and verdant border to the sandy beach in most of the West India islands. Its dark green foliage is shining as though covered with a coating of varnish, like those of the Camellia or Thea, and loaded with its sweet-smelling fruit, resembling a small apple in appearance, it presents altogether a most lovely and tempting object to the stranger, who disembarks for the first time upon the shores of an intratropical region.

The fruit, when ripe, drops from the tree and strews all the ground beneath, tempting the unwary stranger by its fair but treacherous exterior; but left to dry up by the action of the solar heat, untouched by any animal, save the inexperienced visitor. An opinion prevails that the crabs occasionally feed on them, and acquire from thence poisonous qualities: but this opinion appears to have originated merely in the circumstance of their frequenting the spots in which these trees abound; and although they are reputed to be poisonous, when taken from such localities, and are in consequence cooped and fed upon other food for a considerable time before using in most of the islands, this caution seems to be of somewhat questionable necessity; since Jacquin informs us (p. 327) that "in Grenadensi insulâ similibus desumpta locis, sine metu ullo atque impunè comeduntur; nunquid igitur alii est causæ adscribenda Martinicensium noxa?" Like every other part of the tree, the manchineel apple abounds in a caustic milky juice, which blisters whatever part of the naked body it falls upon; and it requires some stretch of faith, to the standard at least of that of the Jew Apella, to believe that so caustic a food could be taken into the stomach of the crab, and communicate poisonous properties to its flesh, without destroying the life, or impairing the health of the eater. The occasionally poisonous properties of the crab must be sought for in some other cause; but this is foreign from our present inquiry.

The timber of the manchineel is of a close and handsome grain, susceptible of a high polish, well adapted for articles of furniture, and of great durability, but injurious to those who cut it down or work it, unless they protect their hands, face, eyes, mouth, nose, and other parts of their body, from the sap and finer particles which fly from it: previously to cutting it down, a fire is usually kindled round the trunk for the purpose of driving off a portion of the caustic milk. The same end might probably be better attained, by cutting off a ring of bark of sufficient extent, just before the commencement of the periodical ascent of the sap.

Every part of the tree, with its leaves, flowers, and fruit, abounds in the caustic milk of which I have spoken: and it is said, that the very drops of rain which fall from its leaves blister whatever part of the naked skin they chance to alight upon. Of this I cannot speak from personal experience, although I have not scrupled to take refuge beneath its friendly shade, from the fury of many a tropical storm.

Hughes, the historian of Barbadoes, acquaints us that the leaves may be used for fish-poisoning, a statement apparently at variance with the imputed impunity with which crabs are said to feed upon the fruit, which abounds in the same sap as that which destroys the fish. Long, nevertheless, repeats the same tale, informing us that "the white land crabs are fond both of the leaves and fruit;" adding, "but I have known persons taken extremely sick at their stomachs after eating these crabs, and who were not relieved until they were disgorged by drinking plentifully of warm water and oil. I remember," he continues, "a negro, who continued ill for three days, from a meal he had made on these crabs, but, without having recourse to medicine, was relieved by natural evacuations downwards, and was perfectly well after them."

We have it also upon the same authority, that "it is well known that goats, and even sheep (Tertre adds macaws) feed very greedily upon the fallen fruit, when it is in a state of perfect maturity, and doubtless resolve it into wholesome nourishment. "Instinct," he observes, "which determines the choice of these animals, points out this as an aliment not baneful (at least to them) for they suffer no injury from it." Jacquin, on the contrary, distinctly says "Nulli unquam animali tactos inveni, etsi vulgo ferantur amati canceris, qui eadem loca, sed ob aliam longè opinor rationem, multitudine vix credibili incolere consueverunt." Jacquin also contradicts the popular opinion respecting the danger arising from the drops of rain which fall from the leaves upon the naked body, and from the imprudence of sleeping beneath its shade; his words are:

> "Fertur etiam arboris umbra noxam inferre subtus recumbenti, sed per trihorium ipsi mihi cum sociis periculum facienti, *nihil mali* evenit. Tam etiam pluviam trans hanc arborem, corporeque nudo exceptam, *innocuam* sum expertus: noxia fortasse fuit, ubi rupti ventis vel imbribus rami foliave hac simul destillaverint pluviæ immixtum."

I have already stated my own experience, which, as far as it goes, coincides with that of Jacquin; and I think it extremely probable, as he conjectures, that the rain falling from the leaves and branches, is only injurious when, from some accidental abrasion a portion of the caustic sap becomes intermingled with the drops.

With respect to the fruit, I once made a trial of its effects by eating a very small fragment immediately before breakfast, trusting to the effect of the food I was about to take, in diluting its acrimony, and thus rendering it innocuous. I experienced no inconvenience from swallowing it, in either the fauces or œsophagus, but its reception in the stomach was attended by a burning sensation, which, had it not been for the counteracting influence of my breakfast, might possibly have terminated in active inflammation. I did not, however, venture to repeat the experiment. Lunan says, that a gentleman of his acquaintance, "who was fond of making experiments, to satisfy himself upon doubtful points, cut the green fruit, and a small quantity of glutinous juice issued out at the wound. He tasted this, and likewise the bark and leaf of the tree; but could perceive only a slight astringency on his tongue. He then cut deeper into the bark of the trunk, and tasted some of the milky juice that oozed out. He observed that it tingled his tongue gently, and rendered his saliva thin and fluid. He afterwards tasted the fruit, nearly ripe, and chewing the ripe part, found it perfectly insipid."

Browne speaks of cases in which the fruit was eaten through ignorance, in which vomiting took place, and probably expelled much of the noxious matter; but a burning sensation continued to affect the fauces, œsophagus, and stomach for some hours after. He says, however, that he *never* knew a case prove fatal, though he has seen persons who had eaten nine or ten of the apples at once; where they disagreed, relief was speedily obtained from oily emulsions and mixtures. In a case mentioned by Dr. Barham, of a negro, who had eat several for the purpose of suicide, the effects were much more severe, and the termination was fatal. The symptoms were a burning sensation in the stomach, without vomiting; the tongue was swollen, the eyes red and staring, and the thirst intense, till death closed his sufferings.

These discrepancies may perhaps admit of being reconciled by the not improbable supposition that the causticity of the sap varies with the seasons of the year, and even, as happens with other intratropical productions, with the phases of the moon; and that it is much more active in the unripe than in the mature fruit. Of this last, we have abundant examples in the various fruits of Europe, which, in their immature state, are harsh and sour, but on ripening have their unwholesome acid converted into sweet and nutritious sugar.

Sir Hans Sloane notices the case of a patient of his own, a turner, who suffered from some of this sap which got into his eye, as he was incautiously felling a tree. The inflammation it excited ran, as might have been expected, very high, but was easily subdued by a strict antiphlogistic plan, accompanied by bleeding, purging, and the application of cold lotions to the part; under which treatment he recovered perfectly in three days. He also speaks of a man who eat four of the apples with nearly perfect impunity.

As is not uncommonly the case, the gum, or rather gum resin, which exudes from the ruptured bark, and is obtainable in greatest abundance in February, is perfectly free from the acrimonious properties of the sap. This gum resin is of a light reddish or yellowish colour, is soluble in rectified spirit, and possesses many properties in common with the resin of the guaiacum officinale; from which it may be distinguished by the colour of the transmitted light, which, in the true guaiacum, is usually of a deep green. The tincture of the manchineel resin has been employed by Dr. Barham as a diuretic in anasarca and other dropsical affections, its exhibition being combined with decoction of contrayerva and iron. The medical properties of this gum resin call for much more minute and careful investigation.

What is the caustic principle contained in the sap—and is it not capable of application to some useful purpose, either in Medicine or the Arts? Does it retain its acrid property when inspissated either by solar or culinary heat? and might it not in that state be applied to some useful purpose, and what?

The acrimony of this sap is said to be corrected by bathing the parts which have been blistered by it with lime-juice, or sea-water, in the immediate vicinity of which it grows: and also by friction of the parts affected, with the buds and young leaves of the white cedar (Bignonia leucoxylon, and B. pentaphylla) which usually grow in society with it.

The apples of the manchineel put into a press or drawers with clothes, are said to banish cockroaches from them.

From the utility of lime-juice in counteracting the irritating effects of the milky sap of the manchineel, it would almost appear as if its acrid qualities arose in a great degree from the presence of an alkali, combined with some other substance which modified, without destroying its causticity. The action differs undoubtedly from that of the dumb cane (Caladium seguinum) but it may not the less proceed from a similar cause—at all events, the investigation is one calculated to awaken the curiosity of the inquisitive, and its results may be the addition of another of our colonial productions to the catalogue of imports.

14, Octagon, Plymouth.

HISTORICAL NOTICE OF THE CHLORIDE OF FORMYLE,

COMMONLY CALLED

CHLORIC ETHER, OR TERCHLORIDE OF CARBON.

BY DR. PEREIRA, F.R.S.

The term *chloric ether* was applied by Dr. T. Thomson (*System of Chemistry*, 6th edit., 1820) to the liquid formed by the union of equal volumes of chlorine and olefiant gas, and which is described in different chemical works under the name of *chloride of olefiant gas*, or the *Dutch liquid*. The formula of this liquid is $C_4 H_4 Cl_2$.

In 1881, Mr. Guthrie, an American Chemist, was led to attempt a cheap and easy process for preparing it, by a statement in Silliman's *Elements of Chemistry*, that the alcoholic solution of chloric ether was a grateful and diffusible stimulant. His process, which was published in Silliman's *American Journal of Science and Art*, vol. xxi., p. 64, January, 1832), was as follows:—

"Into a clean copper still, put three pounds of chloride of lime and two gallons of well-flavoured alcohol, of sp. gr. 0.844, and distil. Watch the process, and when the product ceases to come over highly sweet and aromatic, remove and cork it up closely in glass vessels. The remainder of the spirit should be distilled off for a new operation. These proportions are not essential—if more chloride of lime be used, the etherial product will be increased; nor is it necessary that the proof of the spirit should be very high, but I have commonly used the above proportions and proof, and have every reason to be satisfied with them. From the above quantity I have usually obtained about one gallon of etherial spirit."

Both Guthrie and Silliman erroneously believed the liquid thus obtained to be an alcoholic solution of the chloride of olefiant gas, and hence they termed it *chloric ether*.

In 1831, Soubeiran (*Ann. de Chim. et de Physique*, t. xlviii, p. 131) submitted to distillation a mixture of chloride of lime and alcohol, and examined the distilled product. He found it to consist of

Carbon	14.39
Hydrogen	2.35
Chlorine	83.26
	100.00

The atomic composition which he gave for this liquid was, when reduced to the English mode of calculation, C H Cl; or $C_4\ H_4\ Cl_4$. He termed the liquid *bichloric ether*, because it contains, as he says, twice as much chlorine as is contained in the chloride of olefiant gas.

In 1832, Liebig (*Ann. de Chim. et de Phys.* xlix., p. 146) examined the product obtained by submitting to distillation, in a capacious retort, diluted alcohol and chloride of lime. He analysed the distilled product, but failed to detect hydrogen in it. According to his experiments, the compound consisted of

Carbon	12.6523
Chlorine	88.18
	100.8323

The formula which he deduced from this analysis was $C_4\ Cl_5$. and he called the liquid *chloride of carbon*.

In 1834, Dumas (*Ann. de Chim. et de Physiq.*, lvi. 113, 1834) examined this liquid. He showed that Soubeiran had not obtained it pure, and that Liebig had made an error with regard to its composition. From his analysis of the pure liquid he deduced the following as its real formula: $C_2\ H\ Cl_3$.

On account of the relation of its composition to that of formic acid $C_2\ H\ O_3$), Dumas denominated this liquid *chloroforme*.

Liebig has admitted the accuracy of Dumas's analysis by adopting his formula of the composition of this liquid. He has, however, discarded Dumas's name for this substance, and adopted that of the *chloride* or *perchloride of formule* (*formyl-chlorid*).

Thus, then, it appears that the liquid now used in medicine under the names of *chloric ether*, and *terchloride of carbon*, is altogether different from the chloride of olefiant gas, to which the name of chloric ether was originally applied. Both of these names (chloric ether and terchloride of carbon) have been given to it from erroneous notions entertained of its nature and composition.

VEGETO-MEDICINAL HYDROIDS.

This term has been applied to a new class of preparations, invented by Mr. Yelverton Bosquet, of Stapleford, near Nottingham. They are intended to answer the same purpose as tinctures and infusions, the peculiarity consisting of the use of a menstruum for the solution of the active principles of vegetables; which contains no alcohol, and is at the same time not liable to fermentation.

The proprietor applies his process to hyoscyamus, conium, calumbo, rhubarb, senna, cusparia, gentian, taraxacum, and other articles in general use, as tinctures, infusions, or liquors. The nature of the menstruum is a secret, and on this account no opinion can be given on the subject; but the proprietor states that he has submitted his invention to the Pharmacopœia Committee of the College of Physicians, as well as to many other scientific men, who consider that the introduction of such a class of preparations as these are represented to be, would be advantageous. But while the mode of preparation is concealed, the plan cannot be adopted, and the proprietor declines to reveal his secret without a pecuniary consideration. If his representations be free from exaggeration, it is to be regretted that no means exist of giving the public the benefit without depriving the inventor of the reward of his ingenuity.

The term *hydroid* is objectionable, from its similarity to hydriod.

AN ACCOUNT OF THE ARTIFICIAL FORMATION OF A VEGETO-ALKALI.

BY GEORGE FOWNES, F.R.S.,

Professor of Practical Chemistry in University College, London;
Professor of Chemistry to the Pharmaceutical Society.

(*From the Transactions of the Royal Society for* 1845.)

A few months ago Mr. Morson very kindly put into my hands for examination, a quantity of dark-coloured, viscid oil, amounting to six or seven ounces, which was said to have been produced by the action of sulphuric acid upon bran. The tarry appearance of the oil was evidently the result of oxidation, for the bottle in which it had been preserved during a period of five years was very imperfectly closed; while a second and smaller portion, which had been kept in a stoppered bottle the same length of time, although dark in colour, was perfectly thin and fluid.

A portion of the oil was introduced into a retort, together with a quantity of water, and the whole submitted to distillation; water, accompanied by a heavy, pale-yellow volatile oil, came over. At the close of the process the retort was found to contain a solid, pitchy residue, insoluble in water, but dissolved in great measure by caustic potash, and again precipitable by the addition of an acid.

The distilled oil, separated by a funnel from the water under which it rested, after it having been left a few days in contact with fused chloride of calcium, was distilled alone in a small retort fitted with a thermometer, the bulb of which dipped into the liquid. A little water came over at first with the oil, but this quickly ceased to appear, and then the temperature of ebullition remained quite constant to the close of the distillation, which was conducted nearly to dryness. It was inferred from this experiment that the oil was a single substance, and not a mixture of two or more different bodies.

The water which came over with the oil in the first distillation contained a very considerable quantity of that substance in a state of solution; it was strongly acid besides, from the presence of formic acid.

The purified oil was next submitted to analysis in the usual manner, by combustion with oxide of copper. The following were the results:—

	I.	II.	III.
Oil employed	5.73 grs.	7.79 grs.	5.547 grs.
Carbonic acid produced...	13.18 grs.	17.74 grs.	12.64 grs.
Water produced...........	2.27 grs.	2.96 grs.	2.12 grs.

Hence the composition in 100 parts*, nitrogen being altogether absent—

	I.	II.	III.
Carbon	62.73 grs.	62.11 grs.	62.14 grs.
Hydrogen	4.40 grs.	4.22 grs.	4.24 grs.
Oxygen	32.87 grs.	33.67 grs.	33.62 grs.
	100.00	100.00	100.00

The formula $C_{15}\ H_6\ O_6$, calculated to 100 parts, gives numbers almost coincident with the above, viz.—

Carbon	62.50
Hydrogen	4.17
Oxygen	33.33
	100.00

The following is a summary of the chief properties of the oil:—

When free from water and freshly rectified, it is nearly colourless, but after a few hours acquires a brownish tint, which eventually deepens almost to blackness; when in contact with water, or when not purposely rendered anhydrous, it seems less subject to change, and merely assumes a yellow colour. Its odour resembles that of a mixture of bitter almond oil and oil of cassia, but has less fragrancy. The specific gravity of this substance at 60° is 1.168; it boils at 328° Fahr., and distils at that temperature without alteration. Cold water dissolves the oil in question to a very large extent; by distillation, and fractioning the products, it can be again separated. In alcohol it dissolves with perfect facility. Concentrated sulphuric acid dissolves it in the cold with magnificent purple colour; the solution is decomposed by water, with separation of the oil. If heated with the acid, it is charred and destroyed with evolution of sulphurous acid. Strong hydrochloric acid behaves in a very similar manner. Nitric acid, by the aid of a little heat, attacks the oil with prodigious violence, evolving copious red fumes, and generating oxalic acid, which appears to be the only product.

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* The equivalent of carbon is taken throughout = 6.

Solution of caustic potash, in the cold, slowly dissolves the oil, forming a deep brown liquid, from which acids precipitate resinous matter; by the aid of heat, the same change ensues very rapidly. Metallic potassium was found to be slowly acted upon by the cold oil, but on slightly elevating the temperature, an explosion took place, attended by a voluminous flame and a large deposit of soot, my hand being at the same time severely burned by a portion of the projected potassium.

The most remarkable and characteristic reaction of this substance, however, is with ammonia. When placed in contact with five or six times its bulk of ordinary *liquor ammoniæ*, and left some hours, it is gradually, but in the end completely converted into a solid, yellowish-white, and somewhat crystalline mass, which is very bulky, and perfectly insoluble in cold water. It may be easily collected on a filter, drained from the ammoniacal mother-liquor, and dried *in vacuo* over a surface of oil of vitriol. This substance appears to be the only product of the action of ammonia on the volatile oil.

Portions of the new body, prepared in the manner above stated, and very carefully dried over sulphuric acid, gave the following results on analysis by combustion with oxide of copper. The proportion of nitrogen was determined by the excellent method of MM. Will and Varrentrapp.

	I.	II.	III.
Substance employed	7.94 grs.	6.37 grs.	4.195 grs.
Carbonic acid produced	19.84 grs.	15.57 grs.	10.24 grs.
Water produced	3.24 grs.	2.59 grs.	1.69 grs.

Hence in 100 parts—

	I.	II.	III.
Carbon	66.55	66.66	66.57
Hydrogen	4.53	4.52	4.47

Determination of nitrogen†:—

	I.	II.	III.
Substance employed	6.02 grs.	4.65 grs.	4.45 grs.
Platinum-salt obtained	10.10 grs.	7.62 grs.	7.17 grs.
Per-centage of nitrogen......	10.58	10.54	10.16

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† It may not be amiss perhaps to mention, that in the method adopted the organic substance is strongly heated in a hard glass tube with a mixture of hydrate of soda and quicklime. The whole of the nitrogen issues thence in the form of ammonia, and being condensed into hydrochloric acid, is afterwards converted into chloride of platinum and ammonium, from the weight of which that of the nitrogen is easily calculated.

These results lead directly to the formula $C_{15} H_9 NO_3$; when this is reckoned to 100 parts, it gives—

Carbon	67.13
Hydrogen	4.47
Nitrogen	10.48
Oxygen	17.92
	100.00

Hence it is clear that the solid substance is produced from the oil by the assimilation of the elements of one equivalent of ammonia, and the separation of those of three equivalents of water.

$$\left.\begin{array}{ll} \text{Oil} \ldots\ldots\ldots\ldots & C_{15}\ H_6 \quad O_6 \\ +1 \text{ eq. ammonia} & \quad\ \ H_3\ N \\ \hline & C_{15}\ H_9\ NO_6 \end{array}\right\} = \left\{\begin{array}{ll} \text{solid} \ldots\ldots\ldots & C_{15}\ H_9\ NO_3 \\ 3 \text{ eq. water} \ldots & \quad\ \ H_3 \quad O_3 \\ \hline & C_{15}\ H_9\ NO_6 \end{array}\right.$$

The new substance belongs in fact to the class of the *amides*, which it resembles in many important particulars, as will be more apparent in the sequel.

In the year 1841, Dr. Stenhouse‡ published an interesting paper on a peculiar oily matter, first noticed by Doebereiner, which occasionally appears in very small quantity, in the preparation of artificial formic acid from sugar or starch, oxide of manganese, and dilute sulphuric acid, and to which he gave the name of *artificial oil of ants*. Dr. Stenhouse, in the investigation above referred to, succeeded in preparing this substance at will, and in sufficient quantity to serve the purposes of experiment; he found it composed of carbon, hydrogen, and oxygen; and, what appeared very extraordinary in such a body, the two latter elements were in the proportions to form water. The analytical results, reckoned to 100 parts, were as follows:—

	I.	II.	III.
Carbon	62.59	61.87	62.55
Hydrogen	4.37	4.37	4.46
Oxygen	33.04	33.76	32 99
	100.00	100.00	100.00

These numbers agree very closely with those furnished by the assigned empirical formula $C_5 H_2 O_2$.

There could be but little doubt that the oil upon which I had been experimenting was identical with the substance above described; its properties agreed on the whole pretty well with those assigned by Dr. Stenhouse to his interesting product, with the exception of its extraordinary behaviour with ammonia, which seems to have escaped notice, probably from time being required for the production of the *amide*. To complete the identification, therefore, a small portion of oil was prepared, the process described and recommended being closely followed. 2lbs. of oatmeal, 2lbs. of water, and 1lb. of oil of vitriol, were well mixed in a small copper still, and heated until the pasty mass became thin and fluid from the conversion of the starch into dextrine; the head was then applied and luted down, and distillation commenced. As soon as sulphurous acid began to appear, an additional lb. of water was introduced, and the distillation continued until that gas began to escape in large quantity. The liquid which came over was then rectified to one-half, the product neutralized with hydrate of lime to fix the sulphurous and formic acids, and again distilled, the first third only being collected. A small quantity of heavy yellow oil was thus procured, and an additional portion obtained by again subjecting the watery liquid to distillation. So far as could be seen, this oil corresponded in every particular with that examined by myself; when put into solution of ammonia it formed in a few hours the characteristic yellowish compound, identical in composition and properties with that already described.

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‡ *Philosophical Magazine* for February 1841; also *Annalen der Chemie und Pharmacie*, xxxv., p. 301.

The nature of the oil so far elucidated, it will be proper to return to the subject of the *amide*, or ammonia-compound, the latter term being however hardly applicable. The mode of preparation of this substance has been already described; it is always produced when ammonia and the oil are brought into contact. It is very pale yellow, approaching to white, and nearly inodorous when dry and pure; in cold water it is insoluble; alcohol and ether, on the other hand, dissolve it freely. It may be obtained in tufts of small, short, acicular crystals, by allowing a hot saturated alcoholic solution to cool; or whiter and purer, by adding ammonia to a saturated aqueous solution of the oil, and allowing the mixture to stand several days. In chemical characters this amide much resembles the *hydrobenzamide* of M. Laurent, obtained by putting pure bitter almond oil into solution of ammonia. It is slowly decomposed by boiling water, and even by boiling alcohol, into free ammonia and volatile oil, and very slowly suffers the same kind of decomposition by moisture at the common temperature of the air. When heated, it melts, inflames, and burns with a smoky light, leaving a small deposit of charcoal. Acids decompose it immediately; a salt of ammonia is produced, and the original oil set free.

The action of alkalies on this substance is very remarkable, and well deserves attention. When boiled with a large quantity of dilute solution of caustic potash, it dissolves without the *least evolution of ammonia*, and the liquid deposits, on cooling, small, white, silky needles of a second new substance, having the *same composition* as the amide itself, but all the properties of a stable and exceedingly energetic organic base, possessing alkalinity, and having the power of forming with acids an extensive series of well-defined, and for the most part, crystallizable salts of great beauty.

Portions of the new salt-base, prepared at different operations with the greatest care, were submitted to ultimate analysis by burning with oxide of copper as before, the substance being dried *in vacuo* over a surface of oil of vitriol; the following results were obtained:—

	I.	II.	III.*
Substance employed	2.668 grs.	3.985 grs.	3.698 grs.
Carbonic acid produced...	6 53 grs.	9.74 grs.	9 06 grs.
Water produced............	1.12 grs.	1.63 grs.	1.51 grs.

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* This specimen was prepared from the oxalate by precipitation by ammonia.

Hence, in 100 parts—

	I.		II.		III.
Carbon	66.75	......	66.66	......	66.82
Hydrogen	4.66	......	4.54	......	4.63

Estimation of nitrogen :—

	I.	II.
Substance employed	3.79 grs.	3.75 grs.
Platinum salt produced	6.12 grs.	6.11 grs.
Per-centage of nitrogen	10.18	10.28

The isomerism of the two substances is seen to be most complete; the numbers obtained by analysis absolutely coincide; and yet how discrepant their properties!

I am inclined to think that the nature of the isomeric change which the amide undergoes in presence of the alkali consists simply in a duplication of its elements; at least, this is the simplest view that can be taken. It is besides the only product. It will be seen from analysis of the salts formed by this substance, that the proportion of matter required to form a perfectly neutral compound with an acid, organic or inorganic, is expressed by the formula $C_{30}\ H_{12}\ N_2\ O_6$, which is the double of the *amide* $C_{15}\ H_6\ NO_3$. But then, as the constitution of this latter substance must be to some extent uncertain, since that of the oil is also unknown, and the *amide* forms no combinations, the above view must remain merely conjectural.

I pass now to a description of the properties of the new salt-base, of its principal salts yet studied, and of the best method of preparation on a considerable scale.

The substance itself crystallizes from boiling water in fine, soft, white, silky needles, much resembling those of cafeine, quite permanent in the air, and even in the dry vacuum. It has but little taste, although its salts are very bitter; they are far less so however than those of morphia, or of the bark-alkalies. It is inodorous. At a temperature rather below the boiling-point of water it melts to a heavy, nearly colourless, oily liquid, which on cooling assumes at first the consistence of a soft resin, but eventually becomes brittle and crystalline. When strongly heated in the air, the new substance inflames, burns with a red and smoky light, and leaves but very little charcoal. It is soluble in about 135 parts of boiling water, but after cooling, scarcely a trace remains dissolved. Alcohol and ether in the cold dissolve it with the utmost facility; the alcoholic solution deposits, on spontaneous evaporation, exceedingly brilliant silky crystals; the liquid has a great tendency to creep up the sides of the vessel. The alkaline reaction to test-paper, when dissolved in hot water or alcohol, is exceedingly strong and well marked. Dilute acids dissolve this substance with the utmost ease, becoming thereby completely neutralized, unless employed in excess; from these combinations the base is precipitated in an unchanged state, by the addition of ammonia or of a fixed alkali. A salt of the new base gives no precipitate with solutions of peroxide of iron, oxide of copper or silver, lime or baryta; the hydrochlorate forms with corrosive sublimate a white, and with chloride of platinum a bright yellow double salt. What is rather remarkable, it is not precipitated to any extent by tincture of galls. So powerful are the basic properties of this alkaloid, that when boiled with a solution of sal-ammoniac, it decomposes that salt with evolution of ammonia and formation of a hydrochlorate.

The salts formed by this curious body are exceedingly numerous, and would in all probability well repay a more extended investigation; the few yet examined are the following:—

Hydrochlorate.—This is easily prepared by dissolving the alkaloid in dilute, warm hydrochloric acid, to saturation. The salt, which is perfectly neutral to test-paper, forms tufts of fine, silky, acicular crystals, like those of hydrochlorate of morphia. It is very soluble in pure water, but far less so in an excess of hydrochloric acid. The crystals retain their brilliancy when dried *in vacuo* over sulphuric acid. An analysis of this salt gave the following results:—

(Carbon and Hydrogen.)	I.	II.	III.
Salt employed	5.355 grs.	5.435 grs.	6.115 grs.
Carbonic acid produced	12. grs.	11.12 grs.	12.55 grs.
Water produced	2.49 grs.	2.27 grs.	2.56 grs.

	I.	II.	III.
Carbon	55.89	55.62	55.97
Hydrogen	4.72	4.64	4.66

6.027 grs. salt gave of chloride of silver 2.65 grs. = 10.67 per cent. chlorine.

6.68 grs. salt gave of chloride of silver 2.92 grs. = 10.60 per cent. chlorine.

6.147 grs. salt gave of double chloride of platinum and ammonium 8.24 grs. = 8.45 per cent. nitrogen.

The formula $C_{30}\ H_{12}\ N_2\ O_6,\ HCl+2HO$, reckoned to 100 parts, gives numbers closely agreeing with the preceding; viz.—

Carbon	55.81
Hydrogen	4.65
Nitrogen	8.72
Chlorine	10.98
Oxygen	19.84
	100.00

When a solution of the hydrochlorate of the new base is mixed with one of bichloride of platinum, an insoluble, or sparingly-soluble, bright yellow crystalline precipitate falls, which is a compound of the two bodies. It is blackened and decomposed by boiling. When heated in the dry state, it melts, blackens, and swells up to a prodigious extent, envolving fumes of sal-ammoniac; the incineration of the charcoal is slow and difficult. Examined by analysis, the double salt gave the following results:—

Salt employed	7.28 grs.
Carbonic acid produced	10.16 grs.
Water produced	1.97 grs.

In 100 parts—

Carbon	38.06
Hydrogen	3.

16.43 grs. salt gave of metallic platinum 3.36 grs., or 20.45 per cent.

The formula $C_{20}\ H_{12}\ N_2\ O_6,\ HCl+PtCl_2$, calculated to 100 parts, gives—

Carbon	37.97
Hydrogen	2.74
Platinum	20.90

Nitrate.—This is a very beautiful salt; it forms hard, transparent, colourless, and very brilliant crystals, whose form yet remains to be determined. It is freely soluble in pure water, but very sparingly soluble in excess of nitric acid. The crystals effloresce and become opake in a dry atmosphere. In this state they contain $C_{30}\ H_{12}\ N_2\ O_6,\ NO_5+HO$, as shown by the result of an analysis given below.

Nitrate employed	5.62 grs.
Carbonic acid produced	11,19 grs.
Water produced	2.02 grs.

or in 100 parts—

Carbon	54.30
Hydrogen	3.99

The theoretical quantities are—

Carbon	54.35
Hydrogen	3.93

Oxalate.—The neutral oxalate is a very soluble salt, crystallizing, when the solution is sufficiently concentrated, in tufts of fine needles, like the hydrochlorate. The binoxalate is very sparingly soluble in the cold, and crystallizes remarkably well when a hot saturated solution is left slowly to cool. It forms transparent plates, like those of oxalate of urea, which have a strong acid reaction when dissolved, and retain their lustre in the dry vacuum. This substance gave on analysis the results stated below, leading to the formula $C_{30}\ H_{12}\ N_2\ O_6,\ 2C_2\ O_3+2HO$.

Salt employed	4.808 grs.
Carbonic acid produced	10.05 grs.
Water produced	1.76 grs.

4.85 grs. salt gave of double chloride of platinum and ammonium 5.95 grs., or 7.74 per cent. nitrogen.

Hence, in 100 parts—

Carbon	57.01
Hydrogen	4.06
Nitrogen	7.74
Oxygen	31.19
	100.00

The theoretical numbers are—

Carbon	56 96
Hydrogen	3.91
Nitrogen	7.85
Oxygen	31.28
	100.00

The *acetate* is very soluble, and apparently uncrystallizable, or at least crystallizable with great difficulty.

The following is an excellent and easy method of preparing the vegeto-alkali in a state of purity and whiteness. The *amide*, dried in the air, or better, over oil of vitriol in the vacuum of the air-pump, is thrown into a large quantity of boiling-hot dilute solution of caustic potash contained in a capacious glass flask placed over a lamp or chauffer. After ten or fifteen minutes ebullition the change is complete, the great bulk of the new substance appearing in the form of a heavy, yellowish oil, which, on the removal of the vessel from the fire, collects at the bottom of the flask, and on cooling, solidifies, while that which had been dissolved by the liquid crystallizes out. When perfectly cold, the whole is thrown upon a cloth filter, slightly washed with cold water, and then dissolved in a large quantity of dilute boiling solution of oxalic acid, the acid being kept in considerable excess. The liquid, filtered hot, deposits on cooling a large crop of crystals of the acid oxalate of the base, dark-coloured, however, and impure. The salt may then be collected on a cloth filter, slightly washed and pressed, redissolved in boiling water, and heated for a few minutes with a little good animal charcoal, deprived of its earthy phosphates, &c., by washing with hydrochloric acid. The filtered solution now deposits the acid oxalate in a state of perfect whiteness and purity; from the pure salt the alkali may be obtained in crystals by solution in a large quantity of boiling water, addition of excess of ammonia, and rapid filtration at a high temperature. The crystals which form on cooling require of course washing with distilled water until all the ammoniacal and other salts are removed, and a portion of the alkaloid taken from the filter is found to leave no residue when completely burned on platinum.

I am in great doubt as to the most appropriate names to be bestowed on these curious bodies, and this doubt will remain until more is known respecting the real origin of the oil. This substance has no apparent connection with formic acid, except the accidental one of contemporaneous production. It is allied in *constitution* to the sugar and starch series, inasmuch as it contains oxygen and hydrogen in the proportions to form water, and in *properties* to bitter almond oil and the essential oils in general. So far as my own experiments go, it seems to be produced most freely and in greatest abundance from bran—1 lb. of that substance distilled with half its weight of sulphuric acid, and 3 lbs. of water having yielded nearly a drachm of oil, while mere indistinct traces could be obtained from similar quantities of rice- and potato-starch. Under these circumstances, perhaps, the name "Furfurol" (from *furfur*, bran, and *oleum*) might be applied provisionally; and I am informed that this is the name which was proposed by the party who, several years ago, prepared a considerable quantity of the oil (a portion of which came into my hands, as mentioned at the commencement of this paper), and endeavoured to discover for it economical applications.

The following, therefore, will be the provisional nomenclature:—

Oil produced by the action of sulphuric acid on bran, &c., termed "furfurol," $C_{15}\,H_6\,O_6$.

Product of the action of ammonia on furfurol, or "furfurolamide," $C_{15}\,H_6\,NO_3$.

Vegeto-alkali, "furfurine," produced by the duplication of the elements of furfurolamide, $C_{30}\,H_{12}\,N_2\,O_6$.

In conclusion, I beg to direct attention to the large and promising field of investigation offered by the study of the action of ammonia on the volatile oils, and on other allied bodies.

Middlesex Hospital, Jan. 9, 1845.

NOTE ADDED DURING THE PRINTING.—Since the preceding paper was read, I have received a communication from the gentleman just referred to, Mr. William Coley Jones, late of Plymouth, who has directed my attention to an article in the *Polytechnic Journal*, April 1840, in which he has described some of the more important properties of the oil in question, and among others, its power of generating a solid compound with ammonia, which, when distilled with dilute sulphuric acid, reproduced the furfurol. Mr. Jones prepared furfurol on a very extensive scale from the waste "lignin," or bran, separated from wheat in the process of starch-making; the details of the method, however, are not given, and there are no analyses of the products. I feel no hesitation in expressing my opinion that the honour of the independent discovery of this most curious body is justly due to Mr. Jones, and it is much to be regretted that it did not receive greater publicity.

Aug. 12, 1845.

A NEW METHOD FOR DETECTING SPURIOUS MUSK-PODS.

BY J. MOORE NELIGAN, M.D., M.R.I.A.

Physician to Jervis-Street Hospital, Lecturer on Materia Medica and Therapeutics in the Dublin School of Medicine, &c.

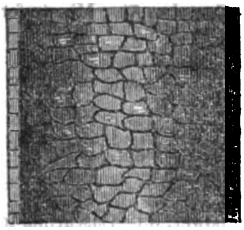
Owing to the high price and great demand for musk, both as a medicine and a perfume, it is very generally much adulterated. This fact is so well known to Apothecaries and to Druggists, that those who have even a moderate consumption of the drug, prefer purchasing it in the unopened musk-bag, or, as it is technically called, *musk-pod.* This precaution, however, is often found not to be a sufficient protection against fraud, as spurious musk-pods are not uncommon in commerce, so well prepared that even the most experienced eye is often unable to distinguish the true from the false.

It is now very generally known, that musk is the peculiar secretion of a small sac, situated immediately in front of the preputial orifice of the male musk animal the *Moschus moschiferus*, and that it is principally imported into the British market from China. The Chinese, finding a greater demand for musk than they are able to supply with the genuine article, squeeze out some of the secretion, which is fluid in the recent state, and mix it with, it is believed, the dried blood of the animal; this compound, which presents the same physical characters as true musk, they put into small sacs made of pieces of the skin cut off from other parts of the animal's body and prepared with the usual ingenuity of this people, so much so, indeed, as almost to defy detection with the naked eye.

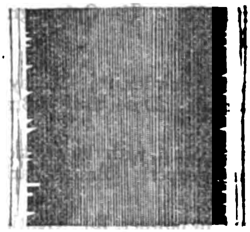
The method hitherto adopted for detecting this sophistication, has been the peculiar position of the hairs, which are arranged in a circular manner around the orifice in the genuine musk-pod, and also the absence of any remains of the penis in the artificial pods. But those characters are not invariable, and I have seen some spurious musk-pods which were so skilfully prepared as to be undistinguishable from the genuine article when compared with them.

The plan which I propose, depends on the microscopic characters of the hairs which grow on the preputial sac of the musk animal, and which, as far as I have been able to detect by direct experiment, differ very remarkably from those of the false sacs which are met with in commerce. This test I have recently had an opportunity of pointing out to my friend Professor Christison, of Edinburgh, and of illustrating it to him from specimens in his own museum. The character of the hairs may be readily understood by a reference to the accompanying woodcut, of which the one marked A.

represents a hair from a genuine, and that marked B. one from a false musk-pod. Hairs of the same size have been selected, and they are drawn as seen through a microscope of 300 diameters.



A.



B.

The difference appears to depend on the fact, that the hairs of this part of the animal are furnished in the interior with distinct regular coloured cells, while in hairs taken from other parts of the animal's body those cells appear to be obliterated, as is generally the case in this and the allied tribes of animals.

The method I have now proposed is a very simple one, and of easy application, and cannot be considered too scientific in the present day, when every Pharmaceutist must be supposed to be provided with a microscope at least of the power above spoken of, without which he could not possibly detect the adulteration of arrow-root and of the other feculas of commerce.—*The Dublin Quarterly Journal of Medical Science.*

[We have examined the musk-pods in the Museum of the Society, as well as some others, and have found the hairs in all the specimens to possess the cellular structure described as characteristic of the genuine pod, although several were known to be spurious. We must not therefore infer that every pod is genuine, the hairs of which possess this character, although its absence may be considered a proof that the pod is spurious.—Ed. *Pharm. Journ.*]

VETERINARY MEDICINES.

Cordials and *Stimulants* are medicines which possess warm and stimulating properties, which are capable of exciting the animal energy, and which are generally given to raise the spirits.

Expectorants (from *expectoro*, to discharge from the breast) are medicines which increase the discharge of mucus from the lungs, and thereby remove or alleviate coughs and difficulty of breathing.

CORDIAL BALLS.

No. 1.

℞ Ginger, in powder, ℔j—Gentian, in powder, ℔j—Honey or Palm Oil sufficient to form a mass. Dose from ℥j to ℥iss. [Morton.]

No. 2.

℞ Coriander Seed, in powder, ℥viij—Gentian, in powder, ℥viij—Ginger, in powder, ℥iv—Caraway Seed, in powder, ℥viij—Oil of Aniseed ℥ss—Honey or Palm Oil sufficient to form a mass. Dose ℥iss. [Blaine.]

No. 3.

℞ The mass No. 2, ℥ss—Powdered Myrrh ʒj—Balsam of Tolu ʒj. Mix to form a ball. [Blaine.]

No. 4.

℞ The mass No. 2, ℥j—Opium gr. xx—Camphor ʒj. Mix to form a ball. [Blaine.]

No. 5.

℞ Pimento, in powder, ℔j—Barley Meal ℔ij—Treacle or Honey sufficient to form a mass. Dose ℥iss. [Bracy Clark.]

No. 6.

The mass No. 5, with the addition of a little Ginger, Cinnamon, or White or Cayenne Pepper. [Bracy Clark.]

No. 7.

℞ Aniseed, in powder, ℔j—Gentian, in power, ℔j—Cascarilla, in powder, ℔j—Honey sufficient to form a mass. Dose ℥iss. [Blaine.]

CORDIAL DRINKS.

No. 1.

℞ Decoction of Chamomile, Oiij—Decoction of Aloes, ℥iv—Ginger, in powder, ℥ss—Sulphate of Iron, ℥iss. Mix and divide into four doses. [Blaine.]

No. 2.

℞ Gripe Tincture* f℥iv—Water f℥viij. Mix for a dose. [Bracy Clark.]

No. 3.

℞ Ginger, in powder, ʒij to ʒiv—Strong Ale (warm) Oj. Mix for a dose. [Morton.]

No. 4.

℞ Caraway Seeds, in powder, ℥ss to ℥j—Strong Ale (warm) Oj. Mix for a dose. [Morton.]

No. 5.

℞ Caraway Seeds, in powder, ℥ss—Ginger, in powder, ʒss—Carbonate of Soda ℈j—Brandy ℥j—Water ℥viij. Mix for a dose. [Gray.]

No. 6.

℞ Aromatic Spirit of Ammonia ʒij—Common Salt ℥j—Water Oss—Mix for a dose. [Gray.]

No. 7.

℞ Barbadoes Aloes ʒiij—Cascarilla, in powder, ʒij—Oil of Peppermint, gtt. xx—Tincture of Cardamoms ℥j—Water (warm) Oj. Mix for a dose. [Gray.]

COUGH BALLS.

No. 1.

℞ Ammoniacum ℥ss—Powdered Squill ℈j—Soap ʒij—Honey enough to form a ball for one dose. [White.]

No. 2.

℞ Asafœtida ʒiij—Galbanum ʒj—Carbonate of Ammonia ʒss—Ginger ʒiss—Honey sufficient to form a ball for one dose. [White.]

No. 3.

℞ Camphor ʒiss—Powdered Squills ʒj—Balsam of Tolu ʒj—Ginger, in powder, ʒij—Honey sufficient to form a ball for one dose. [White.]

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* *Gripe Tincture.*—℞ Pimento, in powder, ℔j—Rectified Spirit and Water, of each Oiij. Macerate for seven days and strain.

No. 4.

℞ Aloes ℥ij—Digitalis, in powder, ℥j—Liquorice, in powder, ʒiij—Honey or Barbadoes Tar sufficient to form a mass. Dose ℥j, twice a day. [Morton.]

No. 5.

℞ Ipecacuanha ʒj—Camphor ʒij—Liquorice Powder ℥ss—Honey sufficient to form a ball. To be given every morning. [Blaine.]

No. 6.

℞ Liquorice powder ℥ss—Linseed or Barley Meal ℥j—Tar ʒss—Honey sufficient to form a ball. [Bracy Clark.]

No. 7.

℞ Emetic Tartar, gr. x. to gr. xv.—Digitalis ʒss to ʒj—Honey sufficient to form a ball. This may be given to cattle, or sheep, in the above dose. [Morton.]

No. 8.

℞ Digitalis, gr. j to gr. ij—Liquorice Powder, ʒij—Honey sufficient to form a ball. [Morton.]

COUGH DRINKS.

℞ Cold drawn Linseed Oil ℥ij—Liquor Potassæ gr. xl—Treacle ℥j—Water ℥x. Mix for a dose. [Bracy Clark.]

CHEMICAL EXAMINATION OF SASSAFRAS ROOT.

BY DR. HUGO REINSCH.

Dr. Reinsch analysed the *bark* of the root, which contains a much larger proportion of the active constituents than the wood. His results are as follows:—

Water	90
Heavy volatile oil Light volatile oil Camphoraceous matter	8
Tallowy matter	8
Balsamic resin Wax	50
Sassafrid	92
Tannic Acid	58
Sassafrid, tannic acid, and gum	68
Albumen	6
Gum, red colouring matter, and salts	30
Starch Reddish brown colouring matter, tannic acid, and salts	54
Starch, tannic acid, &c., extracted by a solution of caustic potash	289
Insoluble woody fibre	247
	1000

The substance called *sassafrid* is a peculiar principle, which may be arranged with tannic acid. It is difficultly soluble in water, but soluble in ether and alcohol. It communicates a dark colour to alcohol.

Sassafras *wood* freed from the bark yielded similar results; but it contained scarcely half the quantity of the constituents which the bark yielded, and the volatile oil was even in still smaller quantity. This fact is especially worthy of notice, because we, in general, obtain from Druggists the wood already cut, the bark being previously removed and sold separately.—*Buchner's Repertorium.*

CHEMICO-PHYSIOLOGICAL EXAMINATION OF ICELAND MOSS (CETRARIA ISLANDICA).

BY DR. G. SCHNEDERMANN AND DR. W. KNOP.

The authors describe this lichen as being composed of three laminæ, as follows:—

1. *The inner layer of globular cells.*—These cells contain the green colouring matter of the lichen, which differs from chlorophylle, and is called by the authors *thallochlor*.

2. *The layer of branching larger cells.*—This layer is colourless. Under the highest magnifying power nothing can be detected within the cells. This layer supports and nourishes the inner layer of globular cells.

3. *The most external and finely cellular cortical layer.*—This layer contains in its intercellular spaces the *lichen starch*. If hydrochloric acid be applied to a section of the cortical layer, the lichen starch swells up into many times its original volume. This layer no doubt also contains *cetraric acid* (formerly called *cetrarin*).

The authors submitted Iceland moss to a careful chemical analysis, and have described, in a very detailed manner, their modes of procedure. They then successively notice the more remarkable chemical constituents of the lichen, viz. *thallochlor*, *cetraric acid*, *lichestearic acid*, an unnamed substance, which is provisionally called *the body C*, and *lichen starch*.

1. *Thallochlor.*—This substance constitutes the green colouring matter of the globular cells before noticed. Its ethereal solution is of a beautiful green colour. Thallochlor has the properties of a weak acid and combines with bases. An alcoholic solution of acetate of lead occasions, with an alcoholic solution of thallochlor, an abundant flocculent green precipitate, which when separated by filtration, then boiled with ether, and decomposed by acetic acid, yields the thallochlor as a brittle and pulverizable mass, which is distinguishable from chlorophylle by its being little, if at all, soluble in hydrochloric acid.

2. *Cetraric Acid.*—This acid, formerly called *cetrarine*, forms a loose tissue of shining minute acicular crystals. It is intensely bitter, not volatile, and is infusible without decomposition. It is almost insoluble in water, which, however, acquires a bitter taste when boiled with the acid. It is soluble in boiling alcohol, but crystallizes in great part on cooling. It is slightly soluble in ether, and quite insoluble in the fixed and volatile oils. Its composition is $C_{34} H_{16} O_{15}$. It is dissolved by both the caustic and carbonated alkalies, and is precipitated from its solution by acids. *Cetrarate of ammonia* ($2 NH_3 + C_{34} H_{16} O_{15}$) is a beautiful yellow salt, having a faint ammoniacal odour and being soluble in water. *Cetrarate of lead* ($2 PbO + C_{34} H_{16} O_{15}$) forms a yellow flocculent precipitate.

3. *Lichestearic Acid.*—The name of this acid is derived from λειχὴν, lichen, and στεαρ (*fat*). When pure it is perfectly white, and forms a loose mass composed of crystalline pearly plates. It is odourless, but has an acrid taste. It is soluble in alcohol, ether, and the volatile and fatty oils; but is insoluble in water. At 248° F. it melts, and on cooling congeals into a crystalline mass. It cannot be volatilized without decomposition. Its composition is $C_{28} H_{24} O_6$. It is dissolved by alkalies, and is precipitated from its alkaline solution by acids. *Lichestearate of potash* is a white indistinctly crystalline powder. *Lichestearate of silver* ($AgO + C_{28} H_{24} O_5$) is grayish white. *Lichestearate of lead* ($PbO + C_{28} H_{24} O_5$) is white also. *Lichestearate of baryta* is grayish white. *Lichestearate of ammonia* is crystallizable.

4. *The substance provisionally called "the body C."*—This substance is found in the lichen in tolerable quantity. It is white or yellowish, without

either taste or smell, insoluble in water, ether, oils, alkalies, and acids, and difficultly soluble in spirit of wine. It is decomposed by heat, leaving 0.2 to 0.3 per cent. of ash. Two analyses gave in 100 parts,

	I.	II.
Carbon	69.99	67.39
Hydrogen	10.82	11.23

By ignition with soda-lime it yielded 0.51 per cent. of nitrogen.

5. *Lichen starch.*—When the pure lichen is treated with concentrated hydrochloric acid, it is converted into an homogeneous mucus. This is treated with water and then separated from the residual lichen by straining it through a woollen cloth. The liquor thus obtained was divided into two parts, to both of which spirit of wine was added until a cloudiness was produced. To one part was further added about one-third of its volume of spirit of wine, by which white flocculi were precipitated. This precipitated liquid was then mixed with the other part of the filtered liquor, and the mixture well shaken and then poured on a stretched woollen cloth. The filtered liquor had the colour and transparency of white of egg, and yielded, on the addition of spirit of wine, a flocculent precipitate, which when collected on a hair sieve and dried presented the usual quantities of boiled and dried starch. If, on the other hand, the muriatic extract be immediately precipitated by spirit of wine, and the precipitated mass washed and then boiled with dilute spirit, the substance separated by filtration does not yield a blue colour with iodine, and possesses the properties which Mulder has assigned to lichen starch.—*Ann. der Chemie und Pharm. Band. IV.*

DR GOUDRET'S AMMONIACAL BLISTERING OINTMENT.

The following improved formula for this application is recommended by the author in preference to that which has hitherto been in use:—

Take of Lard ....32 parts
Oil of Almonds ...... 2 "

Melt the lard with the oil by the application of a gentle heat; pour them in the melted state into a wide-mouth bottle, and add

Solution of Ammonia ....17 parts

Mix, by continual agitation, until it becomes cold. It is necessary to avoid the application of much heat in the preparation of this ointment. When well prepared it will produce vesication in about ten minutes, and will retain its properties unimpaired for about a month, if kept in a well stopped bottle.—*Journal de Pharmacie.*

NOTICES OF BOOKS.

The Dublin Quarterly Journal of Medical Science. New Series, No. 1, February, 1846. *Dublin: Hodges and Smith, Grafton Street. London: Longmans and Co.; Simpkin and Co.; W. Orr and Co. Edinburgh; Maclachlan, Stewart, and Co.; and Sutherland and Knox. Glasgow: David Chambers.* 8vo, pp. 276.

This journal, which has flourished from the year 1832 until the present time, during which period twenty-eight volumes have been published, has now assumed a new and enlarged form. Its pages are devoted to Medical and Surgical Science in all branches, including Chemistry, Materia Medica, and Botany; "unconnected with medical politics, and uninfluenced by party feeling, jealousy, or personal hostility." No. 1 of the new series contains a preface of forty-eight pages by the Editor, in which is given a very interesting summary of the progress of medical science in Ireland during the last two centuries, with a notice of the scientific societies and periodicals which have been established.

Among the former we may enumerate:—

The Dublin Philosophical Society . .	established	1683
The Royal Dublin Society	"	1731
The Physico-Historical Society of Ireland	"	1744
The Medico-Philosophical Society . .	"	1756
Which was merged into		
The Dublin Medical Society	"	1793
The Society called the Paleosophers . .	"	1782
The Association of Neosophers	about	1782
The Royal Irish Academy	chartered in	1786
The Medico-Chirurgical Society		1805
The Kirwanian Society		1812
The Medical Society		1815
The Surgical Society		1831
The Pathological Society		1838
The Obstetrical Society		1838

Most of these societies were rather limited in the number of members, and some of them were of a social character, or scientific clubs. They all contributed, more or less, to the advancement of science, and, in some instances, corresponded with the Royal Society of London, and other scientific bodies, both in this country and on the Continent.

The first medical periodical started in Ireland was a quarterly journal of about 100 pages, which was undertaken in 1807, entitled *The Dublin Medical and Physical Essays; comprising Dissertations and Details of Medicine and Surgery, with their collateral Branches of Science.* It survived only eighteen months.

The first number of the *Dublin Hospital Reports and Communications in Medicine and Surgery,* appeared in 1815—the fifth and last in 1830. Contemporaneously with this periodical was published *The Transactions of the Association of the Fellows and Licentiates of the King's and Queen's College of Physicians, Ireland;* five volumes of which appeared at intervals up to 1828. In 1830 a new series was commenced, entitled *The Dublin Medical Transactions. The Dublin Philosophical Journal and Scientific Review,* which came out under favourable auspices in 1825, was not successful, and was succeeded by a monthly journal edited by Mr. Donovan, entitled *The Annals of Pharmacy and Materia Medica*, the chief object of which was the "improvement of the science of Pharmacy and the condition of the Apothecaries." This journal contained severe strictures on the "so-called monopoly of the Apothecaries' Corporation," and was rather political in its character. It was discontinued after the twelfth number.

In March, 1832, appeared the first number of the *Dublin Journal of Medical and Chemical Science*, the subject of this notice. The original projector and first editor, Dr. Robert Kane, devoted his chief attention to Chemical and Pharmaceutical subjects, merely including Medicine and Surgery, as collateral branches. But shortly afterwards the journal became more extended in its character, and has continued to enjoy a high reputation as a scientific periodical.

The *Dublin Medical Press*, a stamped weekly Medico-Political Journal, appeared in 1839, and is now flourishing; during the past year *The Dublin Hospital Gazette* has been established.

We have been much interested in reading the account of the above institutions and literary productions; and it is satisfactory to observe the increasing disposition which prevails both in England and in Ireland, to encourage and support undertakings of this description.

THE LITERARY AND SCIENTIFIC REGISTER AND ALMANACK, for 1846. By J. W. G. GUTCH, M.R.C.S., &c. *London: Simpkin, Marshall, & Co.*

WE regret that we accidentally omitted to notice this little book at the beginning of the year. It is (as we have observed of its predecessors for the last four years) the most complete and useful pocket-book we have seen, and contains a great variety of information in a very small space. The table of contents occupies six closely printed columns.

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES; *being a Practical and Analytical Digest of the contents of the principal British and Continental Works published in the preceding six months; together with a Series of Critical Reports on the Progress of Medicine and the Collateral Sciences during the same period.* Edited by W. H. RANKING, M.D., Cantab., Physician to the Suffolk General Hospital. Vol. ii. 8vo., pp. 448. *London: John Churchill, Princes Street, Soho. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co.*

The Chemist's Counter Companion, or Complete Retail Price Book, *compiled for the Leicestershire Association of Chemists and Druggists.* By Joseph Goddard. Leicester: J. Burton, Mercury Place. Small 8vo. pp. 208.

This price-book is adapted for the use of Chemists in general, and its arrangement is judicious and convenient. The articles are classified according to the preparations, the extracts, tinctures, pills, barks, woods, oils, &c., &c., being each class respectively arranged in alphabetical order. This plan is more convenient than that of distributing each class of preparations over the whole book—for instance, under the head *Rhubarb*, enumerating root, powder, tincture, syrup, pill, &c. in the same page, which creates confusion. There are columns for the price per pound, quarter pound, and ounce retail, a column for wholesale price, and another for cost price. There is also a column for the place in the shop where each article is kept. In using this column, it is proposed to divide the shop into imaginary compartments, labelled A, B, C, &c., the articles in each compartment being numbered. We have for some time past felt the want of a complete and well arranged price-book, and the one before us is calculated to supply this deficiency.

TO CORRESPONDENTS.

D. E. C.—The term *paregoric* is derived from a Greek word, signifying *to mitigate*, or *to assuage*. *Calomel* is said to be derived from two Greek words signifying *good* and *black*; there is some difference of opinion as to the origin of the application of the term. *Verdigris* is probably derived from the French name *vert-de-gris*, indicating its colour.

M. P. S.—(1.) We know of no better way of making silicate of lime than fusing the ingredients together.—(2.) No.

A Correspondent.—*Nitrite* or *hyponitrite of soda* is obtained by heating nitrate of soda to redness, and removing it from the fire before the decomposition is complete.

B. L. L. H.—We believe oil of worm-seed is not known in this country as an article of commerce. An oil may be obtained by distillation.

J. A.—See vol. v., No. 3, page 110 (valerianic acid).

"A Seeker of Information."—In the process of the Pharmacopœia for making syrupus papaveris, the *ripe capsules* of the poppy are directed to be used, and we should understand this to include the seeds. The shell only would be more properly described as the pericarp.

E. A. P. S.—The addition of a little liquor potassæ, or chloride of calcium, would probably remedy the defect alluded to.

"Inquisitor."—We believe Indian ink is the kind best adapted for pen and ink sketches.

P. Q. R.—*Cachou Aromatisé*, see vol. iii., No. 4, page 91, and vol. v., No. 8, page 380.

An Associate.—The new edition of Gray's Supplement, which will be ready for publication in a few months, will be more comprehensive than the work mentioned.

L. C.—(1.) The Pharmacopœia process for making Mistura camphoræ should be followed in preference to the one alluded to.—(2.) See vol. iv., page 450. If the directions of the Pharmacopœia be followed, crystals will not be formed.—(3.) *Pulv. asari comp.* Take of asarabacca ℥iij, lavender flowers and marjoram, of each ℥j. M.

ʒj.—(1.) We have several times answered the question respecting the ℔j, namely, that it means ℥xij., although it is sometimes used to express the old pint, or ℥xvj.—(2.) See the Pharmacopœia.—(3.) See vol. iv., p. 469, and vol. v., p. 78.

"Alpha," M.P.S.—To obtain the degree of M.D. at Edinburgh or Glasgow, it is necessary to reside at the University during a session. At St. Andrew's no residence is required.

F. C.—The case is one in which we cannot interfere.

A. R.—We must repeat our regret that we have no power to remedy the evil.

"Studens."—To separate arsenic from iron, dissolve in hydrochloric acid, and pass a current of sulphuretted hydrogen through the solution as long as any precipitate is formed.

C. A. B.—No.

C. F. W.—(1.) The Major Examination is similar to the Minor, which is described, vol. ii., No. 8, but is more severe.—(2.) The back numbers of the Journal may be had of the publisher.

"Spero."—The examination of Apprentices is merely classical. The Minor Examination, see vol. ii., No. 8.

T. P.—Retail.

Mr. Thompson (Bedale).—Graham's *Elements of Chemistry*, price 24*s.* Lindley's *Elements of Botany*, price 10*s.* 6*d.*

"Digamma," A.P.S. (Faversham); "Buriensis," and J. R. (Manchester).—Lindley's *School Botany* and *Elements.*

C.—For information respecting the pepper and vinegar licence, see vol. iii., page 313.

We have received "Willatt's Illustrated Catalogue of Optical, Mathematical, Chemical, and Philosophical Instruments," 98, Cheapside, London.

John Lloyd, J. Linney, R. G. W., "Zeta" and J. B. (all of Gosport).—The back numbers may be had of the Publisher.

"Libra."—We quite concur in the sentiments expressed in our Correspondent's letter, in proof of which we refer him to vol. ii., page 1 to 6.

"Aqua," A. P. S.—Yes.

Errata.—In the last number, page 341, line two from the top, *for* 1641, *read* 1461.—Page 364, line one, and 365, lines one and seven, *for* Tyler, *read* Tylor.

Advertisements to Mr. Churchill, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. Smith, 17, Bloomsbury Square, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. X.—APRIL 1st, 1846.

PHARMACEUTICAL LEGISLATION.

So many weighty questions agitate the House of Commons at the present time, that it will probably be difficult to obtain for Medical and Pharmaceutical Reform that attention which is desirable. We have been told, indeed, by many of our friends that the subject cannot possibly be entertained, and that it is useless to attempt to introduce it. But when an important undertaking is in hand, it is policy to go forward, without regarding the doubts and fears which are always prevalent on such occasions.

If we had been influenced by such imaginary sources of discouragement we should not have succeeded in establishing the Pharmaceutical Society; for we were told that the Chemists would not pull together for six months. Neither should we have obtained a Royal Charter; for many of our most sincere friends and supporters declared that it was useless to make the application, as we were not likely to succeed.

It is pusillanimous to imagine that any laudable and rational project is impracticable, and those who would shrink from an effort on such grounds may be compared to the man whose cart stuck in the mud, and who complained to Jupiter instead of putting his shoulder to the wheel. It is quite certain, that if we are determined to gain our point, and take the proper course, we need fear no obstacle. If we fail it will be for want of unanimity and spirit.

Nor is there any reason to anticipate that the business of the nation will be less pressing in 1847 than it is in 1846. It would be vain to wait until the House of Commons has no urgent business on hand. We might as well stand on the banks of the Thames and wait until all the water has flowed into the sea.

It cannot be denied that Sir James Graham has had ample reason to be tired of Medical Reform, and it is not very likely that he will volunteer his services in preparing another Medical Bill, until the profession has come to some kind of understanding as to the nature of the measure which is desirable. But in answer to a Memorial recently presented by the Bristol Association of Surgeons, Sir James Graham stated, that "if a Medical Bill were to be presented to him which had received the sanction of the profession generally, he would willingly bestow upon it his most deliberate attention, as it was his earnest desire to see all the sources of discontent in the profession completely and for ever removed."

It cannot be supposed, after this assurance, that a proper and respectful application from our body would be disregarded, if we could produce the draft of a Bill unanimously supported by ourselves, not militating in any way against other bodies, and being at the same time calculated to benefit the public. We have reason to believe that such a Bill would be supported by those Members of Parliament who have taken an active part in Medical Reform; and that, if strenuously promoted by our own body, it would not meet with any material opposition. In fact, it is not easy to imagine on what grounds opposition could be offered to a measure, the object of which is to introduce a regular system of education among those who furnish the public with medicines.

We therefore contend that the difficulty consists not in passing a Pharmaceutical Bill, but in constructing such a Bill as shall effect the desired object without interfering with the prejudices of other parties. And this difficulty is not one which need occasion apprehension, since any opposition founded on mere prejudice would have but little weight.

The Council of the Pharmaceutical Society have for some time past had the subject under consideration, and we hope some progress will be made during the ensuing month.

THE ELECTION OF THE COUNCIL OF THE PHARMACEUTICAL SOCIETY.

As the Anniversary is approaching, we take this opportunity of reminding the Members of the Society that it is their duty as well as their interest to take a part in the election of officers, and to avail themselves of every opportunity which presents itself of meeting for the transaction of the regular business. One of the objects with which the Society was founded was to promote harmony and unanimity among the Members, and to make the union thus effected instrumental in the advancement of Pharmacy and the protection of the general interests.

For this purpose, periodical meetings, whether of a social nature or for the transaction of business, are especially desirable, and on such occasions each Member should recollect that he has the opportunity of assisting in the work, and that individual exertions are requisite in order to carry on any great undertaking. Those who reside at a distance are precluded from the opportunity of taking an active part in these proceedings, and we have always recommended local meetings as a means of extending the influence of the Society to all parts of the country.

On the last two Anniversaries the Members at large have taken scarcely any part in the nomination of Candidates, and we are told that this may be attributed to the confidence felt by the Society in the existing Council. However satisfactory it may be for this confidence to prevail, it is equally desirable for the Members at large to exercise their privilege in the nomination and election of officers. If they neglect this duty, the Council becomes a self-elected body, as it is their duty to make the needful arrangements for the election, which includes the preparation of balloting papers, and if no other names are proposed, the list nominated by the Council must of necessity be elected. This is not in accordance with the constitution of the Society, which is framed on the most liberal representative principles.

To ensure the welfare of any Institution, it is necessary that a certain number of the managers acquainted with the routine of the business should remain in office at each period of election, and it is usual for half the number, or in some Institutions for two-thirds, to be retained on this account. But in the Pharmaceutical Society only one-third remain in office, the other two-thirds being either re-elected or replaced by fresh officers according to the suffrages of the Members.

Until the 1st of April, any Member has the privilege of nominating a candidate to be placed on the printed list. After that time no fresh nominations can be received until the Anniversary; but any Member present at the meeting may recommend a Candidate or Candidates, who would then and there be balloted for with the others on the printed list.

We mention these regulations in detail that the Members of the Society may be aware of the power they possess, and the mode of exercising it in the election of the managers for each ensuing year.

While it is necessary that some Members of the previous Council should be retained in office to ensure regularity in the routine of the management, it is no less desirable for some fresh Members to be chosen at each election. By this means the interest in the affairs of the Society is extended among a greater number of Members, and the labour is in proportion divided, so as not to press unfairly on a few individuals.

QUACK MEDICINES.

We have read with much interest several articles in recent numbers of the *Lancet*, on the subject of the frauds committed on the public by some of the venders of secret nostrums. The accounts which we gave a few months ago of the itinerant quack doctors, furnished evidence of credulity and "gullibility" on the part of the uneducated public which is truly surprising; but some of the facts noticed in the *Lancet*, in which persons of all classes are concerned, are no less striking. Among the numerous advertisements which daily appear in the newspapers, we see the names of some of the most eminent members of the medical profession: these names being assumed, by the propagators of the nostrums, as a means of attracting the notice and gaining the confidence of the public. Dr. Locock's pulmonic wafers, Ashley Cooper's pills, and Holloway's ointment, recommended by a spurious certificate purporting to be written by Dr. Bright, are enumerated as flagrant examples. To give an apparent authenticity to the statements, some of the quacks have sworn to them before lord mayors, and the editor of the *Lancet* very justly condemns the conduct of the said lord mayors in sanctioning such a proceeding, in violation of an Act of Parliament which came into operation in 1835, and which prohibits the taking of voluntary oaths in that manner in matters not the subject of any judicial enquiry. The editor also blames the medical men whose names are fraudulently assumed or quoted, for not taking proceedings against the culprits, or publicly disavowing any connection with them.

Dr. Locock has, in reply, given a full exposition of the manner in which his name has been prostituted by the maker of the so-called "Dr. Locock's pulmonic wafers," from which it appears that the recipe is fraudulently stated to be that of Dr. Henry Locock, who was the father of the present doctor, and whose decease occurred prior to the introduction of the wafers. Although Dr. Charles Locock is aware that the certificate in favour of this quack medicine is falsely attributed to his father, he had refrained from contradicting it, in the belief that he had no power to put a stop to the nuisance, and that by attempting an effectual contradiction he would entail on himself an endless task, which would only have a partial effect. We can testify, however, that it is desirable in such cases for an authentic and official contradiction to be published in some widely-circulated journal. In the case before us the name of Dr. Locock has given the nostrum some degree of celebrity; and it is now difficult to convince those who have taken a prejudice in its favour, that the formula for the wafers did not emanate from the physician whose name they bear. When we read attentively the statements on the printed bills issued with some of these quack medicines, the long lists of hitherto incurable maladies said to have been completely eradicated, the fulsome testimonials, written or sworn, the poetical fictions occasionally introduced, it is extraordinary that the hand-bill itself is not received by the public as evidence of the imposition. But the disposition to believe what is marvellous and at variance with common sense, prevails to so great a degree, that a hand-bill containing nothing but the truth would be considered insipid and unworthy of notice. As a specimen of the kind of rhodomontade which too often captivates the imagination and deludes unfortunate victims, we give the following, which is a *verbatim* copy of a hand-bill recently forwarded to us.

CONSUMPTION CURED!!

The worst species of ulcerated consumption of the lungs perfectly cured (however great the discharge of purulent matter and blood may be, and although considered by the most eminent of the faculty as altogether beyond the power of human aid) by a regularly-bred medical gentleman, of nearly fifty years' experience.

If the disease is not perfectly arrested or stopped in its progress to death in less than ten days, no remuneration will be expected.

N.B. It is necessary that the patient should be able to stand or walk a little, without assistance.

Apply at No. 80, ——— Street, London.

Many nostrums are widely circulated among the public with panegyrics no less flattering than that which is bestowed on the skill of the above "regularly-bred medical gentleman," and it appears as if the mental faculties of patients were impaired by the influence of bodily ailments, until they lose the power of using their judgment in reference to their own cases, however rational they may be in other matters. On this account the law should secure the public by every practicable means against the description of fraud and robbery under consideration, and it is a very important question—what means would be most effectual for this purpose?

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

ABSTRACT OF A LECTURE
ON ANTIDOTES TO POISONS.

(*Delivered at* 17, *Bloomsbury Square, on the* 25*th of February*).

BY ALFRED BARING GARROD, M.D.
Physician to Fore Street Dispensary, Lecturer on Materia Medica and Therapeutics at the Aldersgate School of Medicine.

The lecturer having defined the term *antidote,* divided antidotes into two classes;—first, those which alter the nature of the poison, and thus prevent its injurious action; and, secondly, those which counteract the effect when once produced. The latter class he passed over as being more within the province of the Medical Practitioner.

The first class, which may be called *direct* antidotes, should be understood by Chemists, and their efficacy depends on their immediate administration, which, however, should not supersede the use of the stomach-pump or emetics for the removal of the poison from the stomach.

Dr. Garrod classified poisons into inorganic and organic. Among the former, the mineral acids and the caustic alkalies should be neutralized by substances harmless in themselves and capable of producing inert or innocuous compounds, a circumstance which should always be considered in the selection of an antidote.* For instance, solution of caustic potash should not be given as an antidote for oil of vitriol; but chalk, magnesia, or bi-carbonate of potash or soda. For oxalic acid, lime water or chalk should be given, not potash or soda. For the caustic alkalies, such acids as are harmless should be selected; for instance, citric or tartaric acid, or vinegar, with mucilaginous drinks. For sulphuret of potassium, the best antidote is chloride of soda.

As an antidote for iodine, starch is efficacious when given in sufficient quantity, as it produces an insoluble and inert compound.

Arsenic being a poison more frequently used than any other, many antidotes have been tried, among which are sulphuretted hydrogen, sulphur, lime water, &c., but this class of substances are less efficacious than the hydrated peroxide of iron, which, however, must be given in such quantities, that there shall not be less than eight or ten grains for every grain of arsenic. Unless given in excess it is not likely to succeed, and emetics or the stomach-pump should also be employed.

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* This portion of the subject was treated of at length by Mr. Taylor, in his lecture on Toxicology, reported in vol. iv., page 349.

Among the mercurial poisons, corrosive sublimate is the most dangerous, and the best antidotes are albumen, gluten, and the protosulphuret of iron. Eggs and flour being generally at hand should be given in considerable quantities. The protosulphuret of iron is prepared by adding hydrosulphuret of ammonia to a solution of protosulphate of iron. When this is within reach it is useful, as it forms an inert compound of mercury when added to corrosive sublimate.

For the salts of antimony—decoction of oak, elm, or other bark, containing tannin, has been recommended, as this forms an insoluble tannate of antimony.

The salts of lead and baryta—may be counteracted by sulphate of soda or magnesia. Albumen and caseine form insoluble compounds with salts of lead; milk may therefore be given. No sure antidote is known for the salts of copper. Sugar has been recommended as an agent capable of reducing copper salts, but it requires for this purpose a higher temperature than that of the stomach. Albumen *in excess* has been proposed; but albuminate of copper is soluble if excess of the sulphate be present.

Common salt is the antidote for the nitrate and other salts of silver, as it forms an insoluble chloride.

The next class — namely organic poisons, are much more numerous than those above mentioned; comprising prussic acid, the alkaloids (strychnia, morphia, &c.), as well as all other vegetable and animal poisons. On this part of the subject the lecturer dwelt more at length, and detailed the result of a course of experiments which had led him to recommend animal charcoal, as an antidote for vegetable poisons in general, as well as for some of the mineral poisons. It has long been known that charcoal (either animal or vegetable) exerts a peculiar action on colouring matters and absorbs gases, on which account it is used in filters for purifying water. It has also been observed to throw down certain substances from their solutions, for instance, lime, iodine, &c., as stated by Professor Graham in his *Elements of Chemistry*. Mr. Warington lately read a paper, at a meeting of the Chemical Society, on the removal of the bitter principle from infusions by animal charcoal*. Makers of morphia and other alkaloids are aware that the product is diminished if much charcoal be used. Bertrand tried wood charcoal as an antidote for arsenious acid, corrosive sublimate, and the salts of copper; but in quantities so small as to be inert.

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* See *Pharmaceutical Journal*, vol. v., No. 5, p. 234.

The lecturer had recently introduced the use of animal charcoal as an antidote for some of the inorganic poisons, but more especially for the organic. Before commencing his experiments it had occurred to him that the gastric juice might possibly interfere with the absorption of the poison by charcoal; but this he found not to be the case. His first experiments were with strychnia, which he administered to two guinea-pigs, in one case with animal charcoal, in the other without; and also to several rabbits. In all cases those animals which took the poison with a proper quantity of the antidote, were not at all affected, while the others died. But it appeared that to saturate half-a-grain of strychnia, two drachms of the charcoal were required, and unless given at least in this quantity, it was not efficacious. The same results were observed in the case of dogs and other animals: one-sixteenth of a grain of strychnia was found sufficient to kill a frog, but with a proper quantity of charcoal a quarter of a grain was given without any poisonous effect. From half a grain to one grain was found to be enough to kill a dog in about ten or fifteen minutes; but when animal charcoal was given in the proportion of half-an-ounce to each grain of strychnia, no effect was produced.

Nux vomica, which in doses of twenty or thirty grains will kill a dog of average size, was rendered innocuous by the administration of half-an-ounce of animal charcoal.

In the experiments with the pure alkaloids the antidote was given with the poison; in the case of the more mild vegetable poisons, the antidote was administered ten or fifteen minutes afterwards, and mostly with a favourable result.

Similar experiments were tried with opium and its preparations. In giving the tincture of opium it was necessary to take into consideration the effect of the alcohol, two drachms of which are sufficient to kill a dog, and this result is not prevented by charcoal.

The emetic properties of ipecacuanha were found to be counteracted by animal charcoal: and the antidote was found equally successful with elaterium, tincture of aconite, aconitine, belladonna, stramonium, hemlock, cantharides, and other vegetable poisons, as well as hydrocyanic acid.

The success of these experiments had induced the lecturer to try the efficacy of animal charcoal as an antidote for the mineral poisons, and with several of them he had found that when given in large quantity it was more successful than the antidotes usually recommended. In many cases it was found to counteract or lessen the effects of arsenic, corrosive sublimate, the salts of lead and copper; but not so completely as to supersede the necessity of administering such substances as are capable of forming insoluble and inert compounds with the poison.

From the above experiments, the lecturer had come to the following conclusions:—First, that animal charcoal has the power of combining with the poisonous principles of animal and vegetable substances, and forming innocuous compounds;—second, that it will absorb and render inert some mineral substances, but, except in the case of arsenic, is not so generally applicable to those poisons as their special antidotes, the quantity required being very great;—third, that a certain amount of animal charcoal is required to neutralise the poison—for morphia, strychnia, &c. half-an-ounce to a grain for the substances from which these alkaloids are obtained, half-an-ounce to a scruple;—fourth, that the charcoal itself exerts no injurious action on the body.

The kind of charcoal employed in the experiments was the purified animal charcoal prepared according to the directions of the *London Pharmacopœia*, namely, ivory-black, digested in dilute hydrochloric acid, washed and dried. It is improved by heating it to redness in a covered crucible. Ivory black, if not purified, must be used in much larger quantity, and vegetable charcoal is efficacious only to a comparatively small extent.

In administering the charcoal it should be triturated with lukewarm water, so as to form a fluid of slight consistency, in the way the antidote may be given in ounce doses, or more, according to circumstances. In the selection of emetics, those only should be used which are not rendered inert by charcoal. Ipecacuanha would not operate in contact with it; but sulphate of zinc should be substituted.

In conclusion the lecturer suggested the propriety of trying animal charcoal as an antidote for other subtile poisons, such as rabies, syphilis, the venom of serpents, &c., applied as a poultice to the part affected, also as a remedy for diabetes, and some other disorders arising from noxious or unhealthy secretions.

PHARMACEUTICAL MEETING,

MARCH 11, 1846,

MR. MORSON, VICE-PRESIDENT, IN THE CHAIR.

A PAPER was read

ON THE MEDICAL AND COMMERCIAL PROPERTIES OF THE CÆSALPINIA CORIARIA OR DIVIDIVI.

BY W. HAMILTON, M.B.

AT one of the meetings of the PHARMACEUTICAL SOCIETY, when the paper on the various species of Cassia and Cathartocarpus found in the West Indies was read, a regret was expressed that the account was unaccompanied by specimens which might have aided the members in drawing their own conclusions as to the opinions advanced, and the statements made. The regret was natural, and the omission one which it would indeed be most desirable to supply, but unfortunately this is no longer in my power. Nearly thirty years have elapsed since I quitted the happy regions of the tropics, and, in the interval, a variety of other subjects have claimed my attention, my specimens have been almost all lost or mislaid, and only a few scattered notes, the *disjecta membra* of my former labours, are in existence—these it is my wish, before I am removed to another state of existence, to render available for the service of younger and more enterprising individuals, possessing, in the rapid advance of Botanical, Chemical, Medical, and Pharmaceutical discoveries, during the last quarter of a century, advantages which never fell to my lot; and, of which, even though they had, the circumstances, in which I found myself placed, would have rendered it perhaps difficult, if not impossible, to have availed myself. Should, however, any fortunate revolution in the wheel of events enable me to revisit those sunny isles of my past recollections, and I may also add, of my affections, and physical strength admit of my encountering the task, I shall gladly devote my leisure to accumulating specimens illustrative of the subjects discussed in these papers, and place them at the disposal of the PHARMACEUTICAL SOCIETY for the use of its members. Even of those productions which are most easily obtained, which grow in every hedge, and are to be had for plucking by every way side, as the *Cathartocarpus bicapsularis*, or *black dog bush* of Nevis, or *Cassia occidentalis*, the *stinking weed* of that island, and *Pois puant* of the French, I should find it impossible to obtain specimens, without going personally in quest of them—an undertaking, at present, all but impossible.

Having said thus much in the shape of apology, to those who, without the explanation now given, might judge, with unmerited severity, of my neglect, I shall proceed to the immediate subject of my present communication.

The CÆSALPINIA CORIARIA is a production of the South American Continent, with which I became acquainted long after my return to Europe, through the indefatigable kindness of my friend Edward Watts, Esq., then British Consul at Carthagena, who sent me ample supplies of the pods and seeds, which last I transmitted to Dr. Bancroft, of Jamaica, by whom they were distributed among the members of the Botanical and Agricultural Society. In a letter of the 3d of August, 1829, Doctor Bancroft acknowledges their receipt as follows:

> "The Vera Cruz packet arrived here last week, and brought me from you a small package of the seeds of the DIVIDIVI, and some three weeks ago I received a quantity of the legumes of some unknown tree from Peru (COULTERIA TINCTORIA) which seem to contain a very large proportion of the tanning principle, and which Mr. Bright has had the goodness to send out to the Society. We are to have one of our quarterly meetings to-morrow, and I shall not fail to present these legumes and your DIVIDIVI seeds. The CULLEN SEEDS (COULTERIA TINCTORIA) have been partly distributed."

From a subsequent letter, which I have unfortunately mislaid, it appeared that plants raised from the seeds so distributed came into flower in 1832, and into full bearing in the following year. A fact of some importance as determining the age at which the seedling plants come into bearing. From a letter of the 3d of September, 1831, received from Mr. McFadyen, the ex-director of the Botanic Garden at Bath, in the Parish of St. Thomas' in the East, it would appear as if it came into blossom twelve months earlier—his statement is as follows:

> "You seem to be under a misapprehension when you say that the DIVIDIVI was indigenous in this island. What I intended to have stated was that, in several situations we had succeeded in raising the plant from seeds which you are kind enough to have sent us. I have two very healthy plants at Hope Estate, *one of which is just coming into flower*, and the other is preparing. So that in a short time we shall be able to try the experiment upon a larger and more satisfactory scale; like its congener, C. PULCHERRIMA it would appear to be adapted to flourish in the hottest and most parched of our plains."

From other circumstances I have been led to apprehend that in making this statement, Mr. McFadyen had, inadvertently confounded the CÜLLEN of Peru, which, as Dr. Bancroft's letter proves, was introduced through the agency of Mr. Bright, who formerly represented Bristol in Parliament, nearly about the same time, with the DIVIDIVI. But even admitting this to be the case, it is evident from the testimony of Dr. Bancroft, that it comes into full bearing in less than four years from the time of first sowing the seed.

Although the fact was unknown, even to the island botanist, at the time of my first sending out the seed, it appears from more recent evidence, that the DIVIDIVI is really an indigenous production of Jamaica, and one which, in their ignorance of its intrinsic value, the planters laboured to eradicate as a nuisance. In the *Alligator*, a valuable paper, which fell to the ground from the want of adequate support, of the 27th of February, 1841, is the following extract from the *Jamaica Journal*, which will be read with interest.

> "As we reported yesterday, specimens of DIVIDIVI were laid before the Jamaica Society; Mr. John Nethersole, who was present, stated to the members that the article had become *exceedingly scarce*, and that he had found it *impossible to procure contracts for a supply of it from South America*. The plant *grows wild on the south side of the island*, and may not unfrequently be mistaken for the CASHEW (Cashaw ? ACACIA TORMOSA). It sheds its pods in great abundance, and the *tanning matter* is so strongly imbued in this, that the earth beneath the trees often becomes so tightly bound that the small descriptions of grass cannot penetrate through it. Hence, as was observed by Mr. Nethersole, the DIVIDIVI has been *hitherto* looked upon rather as a curse than a benefit to the proprietors of the soil. He had no doubt, however, that as the guinea grass (*Holcus sorohum*) would grow luxuriantly beneath in it, it would *not long be thought so*."

Jacquin, who refers the DIVIDIVI to the genus *Poinciana*, from which it is not very distantly removed, describes it as a handsome branching tree of about fifteen feet in stature, covered with a dark spotted bark, and wholly destitute of prickles; the absence of which alone serves abundantly to distinguish it from the CŬLLEN, or COULTERIA TINCTORIA, to which, in its physical properties, it is closely allied. Its leaves are doubly pinnate, and the leaflets of twelve pair without a terminal one; they are oblong, obtuse, smooth, very entire, and marked, in the specimens which Mr. Watts sent to me, as well as in those of some plants raised here from Carthagena seed, on the under surface with minute black spots arranged in two parallel lines: Jacquin's description of them is "foliolis circiter duodecim jugatis sine impari, oblongis, obtusis, glabris, integerrimis, bilinearibus." In my notes made from a personal examination of the specimens which reached me, I find Jacquin's description revised as follows:—

> "Foliolis *subvigintijugatis* sine impari, oblongis obtusis, linearibus, subtus *nigro-punctatis* ; *punctis bilineatim dispositis* in specimine meo."

The flowers are disposed in spikes issuing from the extremities of the branches; they are small yellowish and slightly fragrant. To these succeed oblong, compressed, somewhat obtuse pods, curved laterally, the inner side being concave and the outer convex, their substance is spongy, and within they are submultilocular, a kind of septum being formed between each seed, by the coherence of the inner walls of the pod. The seeds rarely exceed three or four in number, one in each cell, subovate, compressed, and of a brownish colour. They are subject to the attacks of a species of *Bruchus*, which perforating the immature pod lays its eggs within, the larvæ feeding on the seeds and rendering it somewhat difficult to obtain any quantity sound. Jacquin says of the pods,—

> "Legumina fusca matura ab Hispanis et barbaris adhibenturas densanda coria, iisdem nuncupata LIBIDIBI crescit in Curaçao et Carthagenæ frequens; in limosis præsertim inundatisque maritimis; ad salmas."

These pods, which are indifferently called *Libidibi*, *Libidivi* or *Dividivi*, which last name has been chiefly adopted in England contain, according to the admirably conducted experiments of Mr. Rootsey of Bristol, undertaken at my request, above 50 per cent. of tannin, and possibly other matters which may have escaped detection from not having been the immediate objects of attention. The average produce of pods from a full grown tree has been estimated at 100 pounds weight, one-fourth of which consists of seeds or refuse, leaving about 75 pounds of marketable matter. At an interval of six feet apart, an acre of ground will contain 1210 trees, yielding an average of 810 cwts. and 30 pounds, or above 40 tons and a half of marketable matter, worth, at only *5l.* per ton, above 200*l.* Should the interval between the trees be extended two feet more, we shall still have 680 to the acre, the produce of which would not improbably be increased by the increased space given for the extension of the branches: assuming, however, the same estimate as before, we shall still have a produce of above 22 tons 15 cwt., worth at the same price nearly 111*l.*—which, when it is recollected that the ground in which, according to Jacquin, this tree admits of being cultivated is, that which is least adapted to the staple products of tropical agriculture; that, according to the testimony of Mr. Nethersole, Guinea grass can be profitably raised beneath its shade; that, with the exception of the three years which precede the commencement of its bearing, there is hardly any deduction to be made from its returns, it promises to be among the most valuable objects of a planter's attention. By the tariff of 1842 a duty of five shillings was imposed upon DIVIDIVI; but this duty has since been taken off, and it may now be imported free of all charge, except freight and port dues.

Before proceeding to a consideration of the medical properties of the DIVIDIVI, it will be proper to notice the analytic experiments made at my request, by Mr. John Prideaux of Plymouth, and Mr. Samuel Rootsey of Bristol, two gentlemen of whose scientific eminence it would be superfluous for me to speak. It is however right to observe that, notwithstanding the striking coincidence in the results obtained by each of these distinguished chemists, neither had the slightest acquaintance with the proceedings of the other. Mr. Prideaux's experiments had the precedence of Mr. Rootsey's by some three or more years, and Mr. Rootsey's were undertaken afterwards at the instigation of our mutual friend, W. P. Taunton, Esq., after an application to Mr. Herepath, who demanded a remuneration for his analysis, which I was not in a condition to afford. As Mr. Rootsey's experiments were conducted with a somewhat greater attention to minuteness of detail than Mr. Prideaux's, I shall omit the details of the latter, and only give the concluding remarks, in which he says that,

> "From the above experiments it appears the DIVIDIVI *has enormously the advantage of the* (*oak*) *bark*, as far as regards the preservation of animal jelly and the prevention of putrefaction, and to these two properties are generally referred the principles of tanning. It is, however, fair to confess that the theory of tanning is not well understood, and the French who have studied it hardly succeed so well as the English, who work empirically. Mr. Prideaux regrets on this account the bareness of Mr. Tanner's communication to Dr. Hamilton, offering nothing that his investigations might elucidate."

I need not here repeat the whole of the manipulations employed by Mr. Rootsey in the conduct of his experiments, as they must be sufficiently familiar to every practical chemist, but briefly state that he found the pods to yield about three parts of marketable matter and one part of seeds and refuse. On this he observes,—

> "1. A very large proportion of the pulverizable substance appeared to have been bruised off in extracting the seeds before it reached me, and hence I am of opinion that it bears to the husky part a *much larger proportion than what is above stated*. As the great lightness of the article adds so much to its freight, it seems desirable that the gruff residuum should be separated by a mill on the spot where it grows; by this means one half, at least, may be saved in freight. Considering, therefore, that the powder will become the commercial article, I have confined my experiments to that portion: but it is probable that the analysis of the interior, or husky part, may lead to its recommendation for some useful purposes where it grows, as it will be a refuse, if too weak for the tanner's use.
>
> "2. In conducting these experiments upon the DIVIDIVI, it was my object to compare it with some other articles of the Materia Medica, that I might be better enabled to judge of its utility. The articles I selected were OAK BARK, KINO, TERRA JAPONICA, NUT GALLS, TORMENTILLA, and SUMACH. I regret that I have not yet had time to compare it with many which a future opportunity may enable me to do. As these experiments, if repeated, might be expected to vary in their results from many causes, such as (*A*) the season of gathering the fruit; (*B*) the temperature of drying the powder; (*C*) the degree of comminution; (*D*) the difference of weights and errors of scales; (*E*) the time of maceration and the temperature at which it is conducted; (*F*) the care of decanting; (*G*) the fineness of the filter; (*H*) the caution used to collect all the precipitate; and (*I*) the waste in transference from paper to paper; and as the substances submitted to experiment are not crystalline, or naturally of an invariable composition, I have not used much precaution, or great nicety in weighing, my object being rather to form an idea of the use of the DIVIDIVI, than to analyse all the substances accurately.
>
> "3. One drachm, or sixty grains, of each of the substances before mentioned, and in the state of powder, was macerated for forty eight hours, in five ounces, or forty times its own weight of cold distilled water. The first elutriation, the colour of which is seen in column 1, was used in the subsequent experiments: the sediments were afterwards repeatedly re-macerated in more water, and, when dried in a gentle heat, weighed, as in column 2; the water having dissolved as many grains (expressed in column 3) as complete the original drachm.
>
> "4. The first substance of whose action upon these astringents I made a trial was LIME WATER. To three ounces of fresh prepared LIME WATER, I added half-an-ounce, or one-tenth of each infusion, containing the virtues of six grains of its basis; the result is contained in columns 4, 5, and 6. The first shows the *colour*, and the second the *weight* of each precipitate.

The liquors decanted from the above precipitates having the colours mentioned in column 6 as well as,

"5. The original infusions were tested with MURIATE OF IRON: the result appears in columns 7 and 8; and, in order to see whether the *lime water* had been used in sufficient quantity, I tried with the original infusions the different *lime elutriations*, with the result indicated in column 9. The result of these experiments is, that the *lime water* was used in excess, but it did not effectually precipitate all the *gallic acid* from the CATECHU; which, therefore, appears to contain some principle possessing a *superior affinity* for the *gallic acid.*

"6. SUB-CARBONATE OF POTASS was the next test used. It precipitated the SUMACH and the GALLS, and with both likewise produced a black crust, which, by the action of the air dissolved, and rendered the upper part of the solution very dark. The result appears in column 10.

"7. SULPHURIC ACID, in a diluted state, was next tried, as shown in column 11, and occasioned precipitates in the infusions of KINO and POMGRANATE; no effect at all in the infusions of SUMACH and TORMENTIL ROOT; and next to none upon the rest. Whether the substance, precipitated by the *acid*, be of an *acid* nature, and those precipitated by the *alkali*, *alkaline*, I leave for a future opportunity of trying.

"8. One part of ISINGLASS, dissolved in thirty-two of water, was the next substance I experimented upon. Sir Humphry Davy considers that it combines with the *tanning principle* in the proportion of *fifty-four* to *forty-six* of *tannin*. Half-an-ounce of each infusion was added to as much of the *solution of isinglass*, and the results are given in columns 12 and 13. The *leather* precipitated *immediately* from the infusions of DIVIDIVI and GALLS,* but the SUMACH was rendered *milky*, and continued so for *more than a week* without precipitating. The infusion of GALLS *also* continued *milky*, but in *a less degree than* the SUMACH, not precipitating at once, *so completely* as the DIVIDIVI. At length an *eighth of a grain* was obtained from the SUMACH. It is probable that a *stronger* infusion of the SUMACH would have afforded a more copious and more precipitable substance. That from CATECHU, formed a *tenacious ring of leather* at the bottom of the phial; while all the rest were flocculent and very different in colour and appearance from these. The other precipitates, *except those from the* DIVIDIVI, GALLS, and SUMACH, melted in the very gentle heat to which they were exposed in drying; and, as they thus became inseparable from the paper they were not weighed. I wished, however, to determine the weight of the precipitate from the OAK BARK, and therefore repeated the experiment with more care, and then weighing it. Upon the elutriation of gelatine, TINCTURE OF MURIATE OF IRON produced no effect, and LIME WATER very little. The solution of ISINGLASS produced no effect with the elutriations of lime, not even with that of catechu.

"9. INFUSION OF QUASSIA produced no effect upon any of the infusions above-mentioned.

"10. SUGAR OF LEAD, turned the different infusions, as in column 14. It was not tried with the infusions of OAK BARK or SUMACH.

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* Mr. Prideaux's results were very similar. On gradually adding an infusion of 240 grains of OAK BARK, made by maceration in f℥vij. of cold distilled water for forty-eight hours to f℥viij. of a solution of ℥j. of FINE GLUE in an imperial quart of distilled water, the effect was *slow and undecided*, the precipitate *not separating from the liquid*, but remaining *suspended for three days till the whole became putrescent*. But on a similar addition of a similar infusion of DIVIDIVI, the effect was most *marked*, the precipitate *being dense and clotty*, appearing to be from *twenty to thirty times greater in quantity than that from the bark*, and falling to the bottom of the glass in the course of a few hours, after having been thoroughly shaken up and incorporated with the liquid.

TABULAR VIEW OF THE RESULTS OF MR. ROOTSEY'S ANALYTICAL EXPERIMENTS.

Substances Experimented upon.	1.	Solubility.		Effect of Precipitation with Lime Water.			Muriate of Iron.		9.	10.	11.	Action of Isinglass.		14.	15.	16.	Muriate of Tin.		19.	20.
		2.	3.	4.	Colour of 5.	6	7.	8.				12.	13.				17.	18.		
	Colour of Infusion.	Grains of Insoluble Residuum.	Grains dissolved.	Grains of Precipitate from 6 grs.	Precipitate.	Lime Water after Precipitation.	Colour with Muriate of Iron.	Muriate of Iron with original Infusions.	Lime Water Elutriations with the original Infusions.	Action of Subcarbonate of Potass.	Action of Sulphuric Acid.	Colour of the Precipitate.	Grains of Leather obtained.	Action of Super-Acetate of Lead.	Action of Persulphate of Copper.	Action of Protosulphate of Copper.	Depth of the Precipitate.	Weight of the Precipitate.	Muriate of Iron after Muriate of Tin.	Effect of the additional Infusion, after Muriate of Tin had acted.
Dividivi….	Light	14	46	4½	Whitish	—	—	Black ..	White pre-	—	Slight	White….	7½ and 5½	White..	Turbid	Violet..	½	3½	Black	Milky
	brown..	14½	45½	4½	Green..	—	—	Ditto ..	cipitate	—	precip.	Ditto ….	Resinlike							
Nut Galls..	Brown …	25	35	3⅞	Ditto ….	—	—	Ditto ..	Ditto ….	Cream&	Ditto ..	Yellowish	4 and 5½	Ditto ..	Ditto ..	Ditto ..	½	3½	Ditto	Ditto
										precip.		White &								
	" …	24	36	4½	Ditto ….	—	—	Ditto ..	Ditto ….	—	Ditto ..	Turbid .	Resinlike							
Sumach …	Greenish	35	25	1⅝	Ditto ….	Yellowish	—	Ditto ..	Green pre-	Ditto ..	—	White ..	⅛ gr.	—	—	Ditto ..	⅛	⅝	Ditto	Tur-
	brown..	37	23	1¼	Ditto ….	"	—	Ditto ..	cipitate	Ditto ..	—	Turbid ..								bid
Kino ……	Purple …	38	22	1¼	Very dark	Pinkish ..	—	Green..	Turbid ..	—	Precip.	Purple	Melted	Thick ..	—	Thick &	⅛	1⅛	—	Ditto
	" ..	33½	26½	2½	brown red	"	—	Ditto ..	"	—	⅛ gr…	precip. .	Ditto		—	dark..				
Catechu….	Cinnamon	20	40	1⅝	Dark	Reddish	Green-	Green-	Ditto ….	—	Little	Brown	Ditto	Thick ..	Turbid	Dark	⅛	⅝	Green	Ditto
					brown..	brown..	ish ..	ish black			precip.	precip. .	Ditto	Whitish		olive .				
	" ..	19½	40½	3⅝	"	Turbid ..	"	Ditto ..	Ditto ….	—	"	"								
Oak Bark ..	Brown ..	41	19	⅓	Ditto ….	Yellowish	—	Ditto ..	Brown ..	—	Slight	Leather	1⅞ gr.	—	—	—	½	1⅛	—	Ditto
	" ..	43	17	⅞	Ditto ….	brown..	—	Ditto ..	Turbid ..	—	precip.	coloured	Ditto	—	—	—				
Pomgranate	Yellowish	39	21	1½	Lightish	—	—	Ditto ..	Reddish	—	Precip.	Brown	Melted	Thick ..	Turbid	Dark	½	1	—	Very
	brown..	39	21	1½	brown..	—	—	Ditto ..	brown	—	⅛ gr…	precip. .	Ditto			olivè				turbid
Tormentil ..	Wine	43	17	⅝	Dark	Yellowish	—	Green-	Turbid ..	—	—	White pre	Ditto	Turbid .	—	Violet..	⅙	⅝	—	Tur-
	brown..	45	15	⅙	brown..	brown..	—	ish ..	Ditto ….	—	—	cip. ….	Ditto							bid

From Column 13 we find that 100 grains of Dividivi yield a maximum produce of 12.5 of leather, a minimum of 9.6, and a mean of 10.4, and contain a maximum of 5.8, a minimum of 4.0, and a mean of 4.9 of Tannin. Aleppo Galls yield a maximum produce of 8.8 of leather, a minimum of 6.7, and a mean of 7.7, and contain a maximum of 4.0, a minimum of 3.7, and a mean of 3.57 of Tannin; while 100 grains of Oak Bark yield only 2.92 grains of leather, and contain but 1.34 grains of Tannin. Hence the rapid and decided action of the Dividivi, which so forcibly attracted the notice of Mr. Prideaux, is easily to be accounted for. But the Dividivi certainly contains other principles, besides Tannin, of considerable importance, which call for more minute analysis.

"11. I next tried SULPHATE OF COPPER. I perceived but little effect, and sometimes none, with the *per sulphates*, but the *proto-sulphates* gave very curious results; see columns 15 and 16. The precipitates, however, were not weighed nor preserved.

"12. MURIATE OF TIN was the next test used. The comparative copiousness of the precipitates, after standing for twelve hours, is shown in column 17, which contains the depth of the precipitate in the infusion; while column 18 exhibits the weight of the precipitate in grains and fractional parts.

"13. After the action of the MURIATE OF TIN, MURIATE OF IRON affected some infusions and not others, as is shown in column 19; but MURIATE OF TIN itself produced no effect, showing that it had been used in excess. This likewise appeared from adding more infusion, as indicated in column 20. When the elutriation from MURIATE OF TIN was tried with *isinglass*, no effect was produced.

"14. I observed AMMONIA to turn the elutriation from MURIATE OF TIN and GALLS of a violet colour.

"15. EMETIC TARTAR produced no change in any of the infusions.

"16. From columns 4, 8, 12, 16, and 19, DIVIDIVI appears to resemble GALLS and sumach in its properties, more than any other astringents; but from columns 6, 9, 11, 13, 15, 18, and 20, it appears to differ more from SUMACH than from GALLS. It resembles GALLS in every thing, except in the effect of *sub-carbonate of potass* and isinglass, *apparently* from GALLS and SUMACH containing *some principle common to them*, but not existing in the DIVIDIVI; see columns 10 and 12. From column 18, it would appear to be equal in strength to NUT-GALLS; and, from columns 5 and 13, it would appear to be considerably stronger.

"17. I next proceeded to make some *ink powder*, both from the DIVIDIVI and GALLS, according to Mr. Gray's formula; and the writing from each was indistinguishable the one from the other. It has been asserted, and probably with truth, that the durability of ink bears some ratio to the proportionate quantity of NUT-GALLS it contains. As DIVIDIVI seems to be the stronger of the two, it is probable that its ink is more durable, and not less intense in its colour. I may here mention that the powder of GALLS was *very fine* and intended for sale, but the powder of the DIVIDIVI was *coarse*. For the purposes of the dyer also, it would appear that the use of DIVIDIVI would be as beneficial as that of GALLS in the black dye, which might differ slightly in its hue and tint, without being at all inferior to that of GALLS in the depth of its colour.

"18. Sixty grains of DIVIDIVI macerated repeatedly in ALCOHOL, left 16¼ residuum, and afforded, by evaporation of the different tinctures, 41¾ grains, indicating a loss, by excessive drying, of two grains.

"19. Sixty grains, similarly treated with SULPHURIC ETHER, left, in one instance, 19, in another 18 grains of residuum, indicating 41 and 42 grains of soluble matter; of which 28 and 33½ grains only were obtained by evaporation, the remaining 13 and 8½ grains being volatilized during the process. The *ethereal extract* was soluble in water, and became intensely black with muriate of iron.

"20. Half-an-ounce of GALLS, and an equal quantity of DIVIDIVI treated with ALUMINA, fresh precipitated, left of extract, the former 30½, the latter 36 grains. The extract continuing soft, and neither hardening nor crystallizing by gradual evaporation with a gentle heat.

"Where my experiments were repeated, two figures appear in the table, as in columns 2, 3, 5, and 13."

Such were the valuable results of the labours of Mr. Rootsey, which abundantly prove the value of this substance to the tanner and the dyer, a value which is, I believe, duly appreciated in Jamaica, where, if I am rightly informed, Mr. Nethersole has realized a handsome fortune by availing himself of the information communicated to the Jamaica Society in 1829, by Dr. Bancroft, and the subsequent discovery of the plant itself as an indigenous production, whose presence was regarded as a nuisance before the importance of its pods came to be understood.

As a corroboration of the extreme accuracy of Mr. Rootsey's experiments it may not be amiss to notice the close coincidence in their results, in those respects in which they admit of comparison, with the previous results obtained by Mr. Prideaux, of which Mr. Rootsey had no knowledge at the time.

We find on reference to Mr. Rootsey's table, column three, that he obtained a mean produce of 45.75 grains of soluble matter from sixty grains of the Dividivi, being at the rate of 76.25 per cent. Mr. Prideaux, who employed boiling water, obtained 182 grains of soluble matter from 240 grains of Dividivi, being at the rate of 75.8334 per cent., and differing from Mr. Rootsey by only .4166 or less than one-half per cent.

Again, from the same quantity of Oak Bark, Rootsey obtained a mean produce of 18 grains or 30 per cent. of soluble or extractive matter; while Prideaux obtained from 240 grains 70, or 29.1667 per cent. only .8333, or less than one per cent. below the former result.

This close coincidence, in the only points which admit of comparison, justify our most implicit reliance upon those other results announced by Mr. Rootsey, which did not fall within the scope of Mr. Prideaux's experiments.

From the thirteenth column of Mr. Rootsey's table, we find that he obtained a mean produce of 6.625 grains of leather from 60 grains of Dividivi, while the same quantity of the best Aleppo galls yielded only a mean produce of 4.625 grains. Hence it appears, from Sir Humphrey Davy's estimate, that the 60 grains of Dividivi contain 3.0475 grains, or 5.079 per cent. of tannin and 60 grains of galls on 2.12704 grains or 3.545 per cent. Sixty grains of Oak bark yielded only 1.75 grains of leather; whence it follows that it contains but 0.805 of a grain of tannin to the drachm, or not more than 1.34166 per cent. The results obtained from an experiment which my brother, the Reverend J. Vesey Hamilton, induced a tanner at Sandwich to make for me, are such as might have been anticipated. From his report it appears that one part of Dividivi is sufficient for tanning as much leather as four parts of bark, and the process occupies but one-third of the time.

As an external application, an ointment of Dividivi will be found more serviceable in hæmorrhoidal affections than galls or even catechu; and the tincture newly prepared, may be advantageously exhibited in those cases of diarrhœa in which astringents are admissible. But as far as my experience goes, the tincture, possibly from being made with spirit of insufficient strength, speedily undergoes decomposition; becoming turbid in a few days, and forming at length a copious precipitation. This circumstance indicates the necessity for a farther analysis, for the purpose of detecting the presence of other constituents than those which alone were the object of Mr. Rootsey's enquiries.

14, *Octagon*, *Plymouth*, 18*th February*, 1846.

ON DRAGÉES MINERALES,

A RECENTLY PROPOSED METHOD OF ADMINISTERING ARTIFICIAL MINERAL WATERS.

BY MR. MORSON.

The attention of Medical Practitioners in London having been lately called to a new form of medicine, recently introduced from Paris, a few observations on the subject may not be altogether uninteresting to some of the Members and Associates of this Society.

The preparations in question are called *Dragées Minerales*; they resemble badly formed sugared almonds, and weigh from 25 to 30 grains each. On breaking them a small fragment of a crystal of tartaric acid, weighing about four grains, is found in the centre. The enveloping coat consists of tartaric acid and sesquicarbonate of soda, part being in the state of tartrate of soda, but by far the larger portion in an uncombined state. When these dragées are placed in water they dissolve slowly, with evolution of carbonic acid; and, if we believe the statement of the inventor, produce a glass of Seltzer or other mineral water inferior only to that of the natural spring taken at its source; for he will not admit the goodness of bottled waters, since they lose so much of their carbonic acid, which he is enabled to store up in his dragées.

The dragées intended to form chalybeate water contain an admixture of a soluble salt of iron; and those intended for sulphurous water of an alkaline sulphuret, the proportion of which may probably be varied according to the water they are intended to represent. Carbonate of soda and tartaric acid form the basis of all. In some of the Dragées de Spa, which I have examined, no central nucleus of tartaric acid was found, but small fragments disseminated throughout the entire mass.

In addition to the medicinal dragées, the inventor advertised for sale, at all the coffee-houses in Paris, dragées for the instantaneous preparation of effervescing lemonade; and these contained an excess of acid and a little essence of lemon, which, when added to sugar and water, produced the beverage in question.

He further extends this class of preparation by his carbonic acid pills, which, when taken into the stomach, evolve a given quantity of carbonic acid, and, according to his statement, effectually prevents sea-sickness. His dose is from 20 to 100, certainly rather a large number to take at one time, and enough to frighten an unfortunate patient.

These preparations were introduced in Paris in 1841, by M. Jourdain, a Pharmacien, as authorized by royal ordonnance; but I should think the authorization was a mistake, as the words are carefully erased from the lately-circulated prospectus, and, in fact, the preparations themselves are no longer obtainable in Paris, although lately introduced to our notice in London.

It is for medical men to determine the medicinal value of these preparations. It has been stated, that as the carbonic acid is slowly evolved during their solution, a much larger quantity of it remains than would have been retained had powder been employed—the tumultuous effervescence in the latter case causing a more complete disengagement of the gas; but if the substance be employed in fragments this would be avoided.

Of course these preparations produce solutions quite unlike the waters they purpose to represent, and in that respect resemble Seidlitz and other powders; in fact, it is impossible to imitate a water containing free carbonic acid by the solution of any powder, unless we find means to render carbonic acid, in its solid state, permanent.

Many however of these substitutes are elegant and convenient forms of medicine, and the extensive use of some of them is proof of their utility; as such they deserve the attention of the Chemist and Druggist, but how far this new form of a dragée is desirable remains to be proved. I have seen them prescribed and recommended; and being an uncommon form, they may attract some attention for a time. It may therefore be useful for you to know how they may be formed, and you can exert your ingenuity in their manufacture.

Dragées are better known in this country to the Confectioner than the Druggist; in fact, it is only in the laboratory of the former they are well prepared. The manufacture of them is a curious and interesting operation, and requires, to obtain successful results, great dexterity in the operation—a dexterity which, I fear, would throw most of our Pharmaceutical manipulations into the shade. As you may not all be aware how they are prepared, and they appear to have some relation to Pharmacy at present, I may venture a few words on the subject.

Dragées are known in this country under the various names of sugared almonds, comfits of various kinds, and nonpareils. They all consist of some body coated with sugar, generally applied in successive layers. The almond forming the nucleus in the first; in the second, which are of less size, a seed or a small fruit; and in the case of the nonpareil, a small grain of sugar, often of extreme minuteness. These nuclei generally receive, in the first place, a coating of gum and starch, and are then placed in a large heated pan, with a quantity of very concentrated syrup, and rapidly agitated and moved about with the hand, until they are equally coated and have become dry. When this is the case a second portion of syrup is added, and another coat of sugar thus given to them; and this operation is repeated until the desired thickness is obtained. This operation requires to be rapidly performed: it is very fatiguing: yet a workman is expected to produce a daily average of forty pounds weight. There are manipulators so dexterous in performing this operation, that scarcely any difference can be detected in the weight of sugar on the separate nuclei.

A French Pharmacien, named Hippolyte Mége, applies this process to coat five-grain pills of a resinous preparation of copaiba, which are sold under the title of *copaiba Mége*, and appear to have been used in some of the French hospitals, and obtained from the medical faculty honourable notice. They are not difficult to prepare, and certainly have an attractive form.

The dragées, which more especially form the subject of this notice, differ essentially from the common ones—they are not sugar-plums—the coating on them consisting, as I have before stated, of a mixture of sesquicarbonate of soda and tartaric acid. Yet they are hard solid masses, perfectly dry, and containing much carbonic acid. This, at first, appeared to me very curious, and I expected to find them composed of alternate layers of acid and soda, separated by a slight coating of gum. Examination, however, proved this not to be the case, as every part of the dragée effervesced when placed in water, and on reflection it would be difficult to adjust the proportion of acid and alkali in such a process. They may, however, be readily formed, by mixing the proper proportions of acid, and soda, and such other ingredients as you may wish to introduce, into a pillular mass with syrup, mucilage, or a mixture of syrup and mucilage, taking care to add the smallest possible quantity, and operate rapidly; they can then be easily moulded with the hand with the loss of only a portion of the carbonic acid; and a fragment of tartaric acid may be enclosed in the interior if desired, which, however, is not essential. In this way they are readily formed, and may be dried on a moderately heated stove.

The carbonic acid pills would be prepared in the same way.

Whilst considering this subject, I cannot omit to mention the beautiful dragées containing a liquid inclosed in a case of crystallized sugar; they are prepared in the following manner:—

A tray being filled with finely-powdered starch, and carefully smoothed on its surface, impressions are made in it of the forms designed to be executed. A syrup is then prepared with fine sugar, and highly concentrated by boiling, to a point midway between that required for barley-sugar and our usual syrup; this is removed from the fire whilst rapidly boiling and without agitation. A small quantity of rum, maraschini, or other liquor, not containing an acid (which must be avoided) added; this addition will cause a sudden ebulition, which is sufficient to mix it; the hot mixture is now poured into the mould through a paper cone, and in a few minutes begins to set; a small quantity of the powdered starch is then dusted over the surface, the tray covered, and placed in a warm situation; in an hour or two they are finished, and will be found to be a case of sugar enclosing a liquid, which may be preserved for years in that state if not broken.

I am not aware that this form has yet been applied to Pharmaceutical purposes, yet such may probably soon be the case, for who could have imagined that the nonpareils so well known and valued by us, in our childhood, under the delightful name of harlequin's eggs, would in a few years attain the honour and dignity of Homopathic Globules? yet such is the case. In many cases they are still sugar, but in others, sugar of milk has been substituted, for fear, no doubt, that common sugar should prove too active.

The Chairman drew the attention of the meeting to several specimens of the sugar-cane, batatas, cactus coccinillifera, and other vegetable and mineral productions from the island of Madeira, which had been presented to the Society by Signor Nobreiga, one of the pupils in the laboratory.

There were also on the table some specimens of two kinds of tube employed by Mr. Webb, of Islington, *in the manufacture of Soda and other aërated waters.* One kind of tube, which is used where the pressure is not very great, was made of stoneware, or Wedgwood-ware, the different lengths being united by a ball and socket-joint, a contrivance which Mr. Webb had applied in this case, and had found to answer very well. It was stated that Mr. Webb had suggested the use of pipes of this kind for conveying water for domestic use, in those cases where the water was found to act on lead pipes. The other kind of tube used by Mr. Webb in his soda-water manufactory, for conveying the waters when fully charged with gas, and under considerable pressure, was made of pure silver, covered on the outside with pure tin of great thickness.—The above specimens were presented by Mr. Webb to the Pharmaceutical Society.

CONTROVERSY BETWEEN LIEBIG AND THE CHEMICAL PROFESSORS IN FRANCE.

In the *Annalen der Chemie*, for last January, Professor, now Baron, Von Liebig has inserted a critical diatribe, entitled "M. Gerhardt and Organic Chemistry," and a similar article has appeared in the *Lancet* on the 24th of the same month, headed "The present State of Organic Chemistry in France,"—a rather unfelicitous title, since only one really French Chemist is there roughly handled, along with the above-named German Chemist. The readers of Liebig's *Chimie Organique* are aware that this work was translated into French by M. Gerhardt, for which service the Professor, at the end of his Preface, addresses his special thanks, calling him his old friend and pupil, who had been pleased to take an active part in the compiling of his work, and had made numerous and important improvements in it, in consequence of his residence in Paris. His concluding sentence merits peculiar notice: "I feel the necessity of expressing keenly the wishes which I form, that his distinguished talents, and profound knowledge, may enable him to run his career with all the happiness and success which he deserves."

After this high, and no doubt just eulogium, the scientific world must peruse with sorrow and regret the language of bitter reprobation used by the master against his *quondam* assistant. From the evidence adduced in this first article, much provocation has undoubtedly been given by M. Gerhardt, and his co-operator, M. Laurent; since several of the Professor's most elaborate researches and valuable discoveries have been travestied, and in some measure disfigured by these scientific censors to make them pass for their own. M. Gerhardt, now Professor of Chemistry in the University of Monpellier, has unluckily laid himself open to animadversion, by a series of chemical *faux pas*, such as, first, pretending to produce nitrous ether by dissolving brucine in nitric acid, where no alcoholic or etherous principle is present;—second, the production of valerianic acid by the action of hydrate of potash upon indigo at a high temperature—a result quite unattainable in practice and at variance with all theory;—third, his denial of the existence of the nitrate of oxide of ethyle, or nitrous ether, which has been so fully demonstrated by Professor Liebig;—fourth, M. Gerhardt's statements on the composition of chinoline, chinine, and chinchonine, subjects in which he has conjured up a series of fictitious formulæ, calculated to throw discredit on this seductive but most fallacious mode of representing atomic transmutations;—fifth, upon mellon, hydromellonic acid, melam, and melamine, a class of interesting organic compounds, discovered and well investigated by Liebig and L. Gmelin, M. Gerhardt has hazarded statements contradictory of the conclusions of these profound philosophers, which any one who has studied the metamorphoses of sulpho-cyanogen, must know to be utterly unfounded, and for which he receives from his former master a severe but well merited castigation. In order to give greater currency to his bold lucubrations, the Montpellier Professor published, in January 1844, a general report of the progress of Chemistry, under the title *Comtes Rendus, complets, serieux, et concis*, in which he has given a mutilated view of Liebig's researches on some of the mellonic compounds, particularly the mellonide of potassium; the defects and errors of which view are in the present memoir, chastised by as sharp an application of the birch as ever school-boy received from an irritated preceptor.

The Baron next takes M. Laurent to task, whom he treats with as little ceremony as his *ci-devant elève;* prefacing his censure by saying, "If I cannot allow this opportunity to pass without expressing my opinion of M. Laurent, people must keep in view with what sort of a man he has associated himself." Now we must confess that though the French Chemist has been guilty of some oversight in reviewing the labours of the German Baron, his merits and total independence should have saved him from such a volley of sarcasms concerning his general character, temper, and disposition, as are here showered upon him. In the second index to Liebig's *Chimie Organique*, at the end of the third volume, where we have a tabular view of the sources of the facts adduced in the work, we find the name *Laurent*, in connexion with a long train of valuable discoveries; for example—the naphthalic series, in several numbers of the *Annales de Chimie et Physique*; on bituminous schist and paralline; on the chlorides and bromides of carburetted hydrogen; the benzoic series in the *Annales de Chimie*; on paranaphtaline; the phenic series; on camphoric acid; the liquor of the Dutch ethers; the oleic and elaïdic acids; the ethers of fat bodies; on pinic and silvic acids; on resins; on indigo; on the bromure of benzine; the essence of estragon (tarragon); and on the essence of cinnamon. To this list of original researches, recognized and referred to by the Baron, two years ago, many more might be added, which do honour to this ingenious Chemist; and they are amply sufficient to entitle him to more courtesy than he has now received. We willingly admit that both M. Laurent and his German co-operator have been too precipitate in the promulgation of their general laws of atomic combination, and that the erroneous rules they have laid down deserve to be exposed; but all this should be done in a dispassionate tone. The Baron feels incensed, and not unjustly, because the twin censors, the *par nobile fratrum*, pervert his researches not only by misquotation, but by ascribing to him statements which he had never made. "Where," says he "have I ever stated that mellonide of potassium may be produced by dissolving mellon in potass ley; or that hydro-mellonic acid is resolved by the action of heat into mellon and hydrogen? These are mere inventions of MM. Gerhardt and Laurent." Such unwarrantable conduct is no doubt very provoking, but genuine Chemists would spontaneously distinguish between truth and falsehood in such investigations, and award the palm of merit to the real discoverer, and thus save him from the degrading task of angry expostulation. How much the Baron has been annoyed, will appear from the last paragraph of his vindication, with which we shall conclude our general notice:—

> "M. Gerhardt's conduct for the last few years has appeared to me that of a freebooter, who, from his ambush (the Comtes *rendus*, *serieux*, et *concis*) falls upon and plunders quiet travellers, decks himself with their clothes and jewels, and then struts through the streets. But this cannot be allowed to proceed further. In a second article I intend to discuss M. Gerhardt's theories."

THE PATENT CARRARA WATER.

Some of our Correspondents having made enquiry respecting this preparation, and others of a similar nature, we insert the following circulars, which have been issued on the subject:—

TO THE AGENTS FOR MAUGHAM'S PATENTED CARRARA WATER.

In consequence of advertisements having appeared in the public papers from some of the soda-water manufacturers, announcing that they make the Carrara water, Mr. Dunlop feels it necessary to inform his agents that this beverage is protected by Her Majesty's letters patent, and that he is the sole manufacturer. Any preparation, therefore, under the name of Carrara water, except that procured from Mr. Dunlop, will render the vendor subject to immediate legal proceedings.

76, *Upper Thames Street, Feb.* 28*th*, 1846.

SCHWEPPE'S ÆRATED LIME WATER.

Messrs. Schweppe and Co. beg to inform chemists, and other retailers of mineral waters, that they have for years made, and continue to make, ærated lime water, which is known in many cases as a valuable antacid, but from its injurious effects in others, is not recommended to be used indiscriminately, but only under medical direction: price, same as their soda, potass, and magnesia waters.—This notice is considered necessary, in consequence of a circular having been issued by a party, professing to have taken out a patent for this water (under a fanciful name), threatening legal proceedings against any one vending it, except such as is manufactured by themselves. Messrs. Schweppe and Co. beg to state, that no patent for this water is capable of protection; and should proceedings be commenced against any of their agents, steps will be immediately taken to defend the action.

51, *Berners Street, London, March* 12, 1846.

Mr. Webb, and other soda-water manufacturers, have also offered to the public their ærated or carbonated lime-water.

Without entering into the merits of the legal points in dispute, which will, in all probability, be shortly settled before a proper tribunal, we leave the two statements to speak for themselves, each being supported by a champion ready to try the question in a court of law.

From the existence of lime in a greater or less quantity, in almost every natural spring, and in all river or other water used as a common beverage, we may infer that this alkaline earth is designed by nature for some good purpose in the animal economy; and we believe it is generally admitted by Chemists that, with a few exceptions, referable to particular disorders, water is most wholesome when containing some salts in solution. At the same time, in the cases alluded to as exceptions, lime is not a desirable ingredient, and in all cases it is possible to exceed the bounds of due moderation in the use of this remedial agent. We, therefore, concur in the opinion that lime-water should not be too generally and indiscriminately used as a beverage without medical advice. It has often occurred that excellent remedies have fallen into disrepute in consequence of injudicious administration.

STRAMONIUM CIGARS.

Stramonium has for a long time been recommended as a remedy for asthma and other disorders of the chest, and it is frequently used in a pipe with a portion of tobacco. Mr. Butler, of Covent Garden, has recently introduced cigars composed of the leaves of this plant, and we have been informed by several patients who have tried them, that the plan is more convenient than the one formerly adopted, and that the remedy is quite as efficacious, if not more so. A short time ago a caution was issued to Chemists, to the effect that these cigars could not legally be sold without a cigar licence, and on this account we have deferred our notice of them. But we are now informed that this objection is overruled, it being decided that the stramonium cigars may be sold without a licence as a remedy, as no tobacco enters into the composition.

In France, not only stramonium but several other medicinal plants are used in the form of cigars; and we have been informed that advantage has been found to result from the practice in some cases.

ON BENZOLINE,

A NEW ORGANIC SALT-BASE FROM BITTER ALMOND OIL.

BY GEORGE FOWNES, ESQ., F.R.S.,
Professor of Practical Chemistry in University College, London;
Professor of Chemistry to the Pharmaceutical Society.

(*From the Philosophical Transactions for* 1848.)

WHEN pure oil of bitter almonds is left some days in contact with a strong solution of ammonia, at the ordinary temperature of the air, it is slowly, but in the end completely converted into a white crystalline substance, insoluble in water, but readily soluble in hot alcohol. The solidification of the oil is complete, and there is no secondary product. This substance was examined by M. Laurent,[*] who conferred upon it the name of *hydrobenzamide,* and assigned to it the formula $C_{42}\,H_{18}\,N_2$; it is generated by the union of the elements of two equivalents of ammonia with those of three equivalents of hydruret of benzoyle, and the separation of six equivalents of water.

$$\left.\begin{array}{lllll}\text{3 eq. bitter almond oil} & C_{42} & H_{18} & & O_6 \\ \text{2 eq. ammonia ....} & & H_6 & N_2 & \end{array}\right\} = \left\{\begin{array}{lllll}\text{Hydrobenzamide} & C_{42} & H_{18} & N_2 & \\ \text{6 eq. water ......} & & H_6 & & O_6\end{array}\right.$$

$$C_{42}\,H_{24}\,N_2\,O_6 \qquad\qquad C_{42}\,H_{24}\,N_2\,O_6$$

Acids decompose hydrobenzamide immediately, with separation of bitter almond oil and formation of salt of ammonia; with alkalies the case is different, solution of potash, even at a boiling heat, occasioning, as remarked by M. Laurent, no perceptible change. I found, however, that when the boiling was prolonged for some hours, a change was induced resembling that undergone by *furfurolamide*[†] under similar circumstances. A few brownish crystalline flocks appear in the solution, and after cooling, the cake of resin-like substance is found harder and less fusible than hydrobenzamide which has been melted and left to solidify. This change is unaccompanied by any notable alteration of weight, although a faint odour of bitter almond oil is disengaged during the whole course of the ebullition. The new substance is an organic salt-base, having the same composition as hydrobenzamide itself; it might perhaps with propriety be called *benzoline.*

The salts formed by this substance are for the most part remarkable for sparing solubility, with the exception of the acetate; the hydrochlorate, the nitrate, and the sulphate are crystallizable; the last-named salt is exceedingly beautiful, crystallizing from an acid solution in colourless prisms resembling those of oxalic acid.

Precipitated by ammonia from a cold solution of the hydrochlorate or sulphate, benzoline separates in white curdy masses, which when washed and dried diminished greatly in volume; when quite dry the powder is singularly electric; if rubbed with a spatula its particles repel each other with violence, scattering the powder over the paper on which it lies. It is not sensibly soluble in water, but dissolves with great ease in alcohol and ether. A hot alcoholic solution left for some time deposits the base in brilliant transparent colourless crystals, which apparently have the form of square prisms with variously-terminated summits; the alcoholic solution is strongly alkaline to test-paper. At a temperature below 212° benzoline melts, and on cooling assumes a transparent glassy state, without any tendency to crystallization. Heated in a retort, it boils and at length entirely volatilizes, with scarcely a residue of charcoal. Ammonia is disengaged during the distillation, a highly volatile oily liquid, having the odour of benzine, collects in the receiver, and a crystalline solid matter condenses in the neck of the retort. This latter substance, which seems to be the most abundant product, has been but partially examined; it is described below under the name *pyrobenzoline*.

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[*] *Ann. Chim. et Phys.* lxii. p. 23.

[†] See *Pharm. Journal,* p. 414,

The action of oxidizing agents upon benzoline is remarkable. When heated in a retort with a mixture of bichromate of potash, sulphuric acid and water, it is attacked with great energy, the mixture becomes dark green, and on distillation benzoic acid in large quantity passes over with the vapour of water. With nitric acid the same change seems to occur, but the action is not so definite and speedy. Hydrobenzamide, under similar circumstances, yields the same product, accompanied however in the first part of the distillation by a little bitter almond oil. Melted hydrate of potash appears to exert no action on benzoline, unless the temperature be excessive.

The composition of this substance, and its isomerism with hydrobenzamide, are shown by the following analyses:—

	I.	II.	III.
Substance	4.018 grs.	4.03 grs.	4.57 grs.
Carbonic acid produced	12.37 grs.	12.46 grs.	14.14 grs.
Water produced	2.21 grs.	2.18 grs.	2.52 grs.

In 100 parts—	I.	II.	III.
Carbon	83.96	84.32	84.38
Hydrogen	6.11	6.01	6.12

The nitrogen was determined by the process of MM. Will and Varrentrapp, as below:—

	I.	II.
Substance	3.88 grs.	5.036 grs.
Platinum-salt produced	5.57 grs.	7.28 grs.
Per-centage of nitrogen	9.07	9.12

Hydrobenzamide contains by calculation in 100 parts—

Carbon	84.56
Hydrogen	6.04
Nitrogen	9.40
	100.00

Hydrochlorate.—The hydrochlorate of benzoline is a sparingly-soluble salt, even in boiling water. It crystallizes from a hot solution in small but exceedingly brilliant colourless needles, which effloresce in the dry vacuum. It has, in common with the other salts, an intensely bitter taste. The salt, deprived of its water of crystallization, gave the following analytical results:—

	I.	II.
Substance	4.25 grs.	4.458 grs.
Carbonic acid produced	11.71 grs.	12.30 grs.
Water produced	2.21 grs.	2.32 grs.

In 100 parts—

	I.		II.
Carbon	75.14	...	75.25
Hydrogen	5.77	...	5.78

Estimation of nitrogen and chlorine :—

Substance	4.16 grs.
Platinum salt produced	5.17 grs.
Per-centage of nitrogen	7.83

	I.	II.
Substance	5.858 grs.	4.218 grs.
Chloride of silver produced	2.32 grs.	1.76 grs.
Per-centage of chlorine	9.64	10.12

The formula $C_{42}\ H_{18}\ N_2,\ H\ Cl$ gives in 100 parts—

Carbon	75.33
Hydrogen	5.68
Nitrogen	8.41
Chlorine	10.58
	100.00

The crystallized salt was found to lose by efflorescence 2.4 per cent. of water, corresponding very nearly to one equivalent.

The hydrochlorate of benzoline forms with bichloride of platinum an insoluble double salt of a pale yellow colour, not further examined.

Nitrate.—The nitrate is even less soluble than the preceding salt; the crystals are small and have but little brilliancy; they are permanent in the dry vacuum. A portion subjected to analysis gave the following results:—

	I.	II.
Substance	4.112 grs.	4.27 grs.
Carbonic acid produced	10.51 grs.	10.91 grs.
Water produced	1.97 grs.	2.08 grs.

In 100 parts—

Carbon	69.71	...	69.68
Hydrogen	5.32	...	5.28

The formula $C_{42}\ H_{18}\ N_2,\ NO_5+HO$, gives in 100 parts,—

Carbon	69.77
Hydrogen	5.26

The *acetate* is a very soluble salt; it dries up on evaporation to a gummy adhesive mass, and probably crystallises with difficulty, if at all.

Pyrobenzoline.—This, as before observed, is the solid product of the dry distillation of benzoline. It is pressed between folds of bibulous paper to free it as much as possible from oily matter, and then crystallized from boiling alcohol, in which it dissolves pretty freely. It is but sparingly soluble in alcohol in the cold, and apparently quite insoluble in water, dilute acids and alkalies. It is tasteless, and the alcoholic solution has little or no alkaline reaction. At a high temperature this substance fuses, and with still further increase of heat distils; it sublimes at a temperature below its boiling point, the vapour condensing in feathery crystals like those of benzoic acid. Melted pyrobenzoline on cooling forms a mass of radiated crystals, presenting a great contrast to the glassy or resinous appearance of benzoline under similar circumstances. This substance was at first imagined to be a hydrocarbon ; it contains nitrogen, however, and gave on analysis the results stated below.

	I.		II.
Substance	4.295	grs.	3.46 grs.
Carbonic acid produced	13.42	grs.	10.74 grs.
Water produced	2.08	grs.	1.71 grs.

Hence, in 100 parts—

	I.		II.
Carbon	85.21	...	84.66
Hydrogen	5.38	...	5.49

Estimation of nitrogen :—

Substance	4.15 grs.
Platinum salt produced	6.00 grs.
Per-centage of nitrogen...	9.11 grs.

These numbers lead to the formula $C_{21} H_8 N$, which gives in 100 parts—

Carbon	85.1
Hydrogen	5.4
Nitrogen	9.5
	100.0

This, which appears to be a neutral body, together with its accompanying liquid product, deserves a more extended examination.

The hope which I ventured to express in a former paper of the formation of new organic bases from the volatile oils which unite with ammonia, by subjecting their *amides* to the influence of agents, as caustic potash, capable of bringing about metamorphosis of the compound into a more stable form or forms of combination, has thus been partially fulfilled.

M. Laurent has recently announced the discovery of a new substance obtained from bitter almond oil, isomeric with hydrobenzamide, possessing basic properties, and corresponding in some other respects with benzoline ; it is stated however to be volatile without decomposition, which is certainly not the case with that body. The name *Amarine* was conferred upon it.§ The publication of the experiments in detail will probably determine the identity or separate nature of the two substances.

Middlesex Hospital, May 8, 1845.

SOME EXPERIMENTAL RESEARCHES TENDING TO DISPROVE THE EXISTENCE OF PROTEINE.

BY BARON LIEBIG,
Professor of Chemistry, Giessen.

ON THE SUPPOSED BINOXIDE OF PROTEINE.

According to Bouchardat, if moist fibrine be immersed in water acidulated with a two-thousandth part of hydrochloric acid, the fibrine speedily becomes gelutinous, and on continuing the action of the dilute hydrochloric acid, a solution is obtained, which is turbid. This turbidity appears to arise from a slight admixture of a fatty substance. That portion of the fibrine which is thus soluble in hydrochloric acid, Bouchardat designates by the term ALBUMINOSE, the insoluble part by that of EPIDERMOSE.

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§ *Comptes Rendus*, xix. p. 353.

Mulder states that this experiment was repeated by Herrn Von Baumhauer. The solution of fibrine in dilute hydrochloric acid Baumhauer precipitated by means of carbonate of ammonia, and treated the precipitate with alcohol. After drying, the precipitate yielded on analysis,—

	1	2
Carbon	53.64	55.62
Hydrogen	6.88	6.73
Nitrogen	15.88	—
Oxygen	23.64	—

M. Mulder concludes, from these experiments, that " the albuminose is a product of the oxidation of proteine, which, no doubt, is formed by the action of the atmospheric oxygen upon the matter formed and dissolved by the hydrochloric acid. It is *binoxide* of proteine = $C_{40}\ H_{62}\ N_{10}\ O_{14}$"

We have of late been so overwhelmed with descriptions of substances, which, although greatly differing in their properties, yet, according to their analyses, must be considered as oxydes of proteine, that I was very desirous of convincing myself, by experiment, of the existence of at least one of them.

I have found, that if we are to understand by the designation, *binoxide of poteine*, a substance which contains no sulphur, the substance investigated by Baumhauer cannot belong to such a class of bodies as oxides of proteine, since the whole amount of sulphur present in fibrine exists unaltered in this new substance.

In the first place, I have observed that the atmosphere and its oxygen have no share in the solution of fibrine in hydrochloric acid. If moist fibrine is allowed to become gelatinous in dilute hydrochloric acid, and the mixture copiously diluted with water, and immediately afterwards filtered, before the solution has taken place, the presence of lime and potass may be detected in the filtered fluid. If the fluid be exposed to the protracted action of a higher degree of heat so as to affect the solution, and a portion of this heated to boiling, with an excess of potass, the subsequent neutralization with acetic acid gives rise to a copious evolution of sulphuretted hydrogen, and a drop of acetate of lead produced in it a black precipitate. Upon solution of fibrine in dilute hydrochloric acid of the above given strength, therefore, the sulphur remains combined with the other elements of the fibrine. If this solution of fibrine in hydrochloric acid (the albuminose of Bouchardat) is mixed with a solution of common salt, sulphate of soda, or nitrate of potass, the mixture coagulates, forming a caseous or albuminous mass, which may be washed with a solution of common salt, the fluid which runs off, containing common salt, contains no longer any perceptible traces of lime or phosphoric acid : these two substances are, however, contained in the precipitate. The fluid contains no oxygen compound of sulphur, and gives no reaction of sulphuret of potassium when boiled with potass ley. But, according to Mulder, the albuminose of Bouchardat is binoxide of proteine; were it so, the precipitate ought to contain neither phosphate of lime nor sulphur; but on dissolving it in potass ley, and boiling, and adding, subsequently, salts of lead, a black precipitate of sulphuret of lead is produced, and the action of acid produces an evolution of sulphuretted hydrogen.

This substance is, therefore, not a binoxide of proteine.

ON THE PRESENCE OF SULPHUR IN THE NITROGENOUS CONSTITUENTS OF PEAS.

Mulder says, p. 307 of his *Physiological Chemistry*, " According to Rochleder, legumine and caseine stand in close affinity to one another, and differ only in their respective reactions with acetic acid. This is no longer legumine, but proteine, free from sulphur and contaminated with an extraneous substance, the admixture of which lowers the proportion of nitrogen and carbon by about one per cent. The composition of legumine, therefore, is unknown. Rochleder states legumine to contain a certain proportion of a substance insoluble in potass and in ammonia, and, moreover, an admixture of sulphur. The latter statement is incorrect with regard to legumine obtained from almonds and peas, since this contains free sulphur."

If, with MM. Dumas and Cahours we call legumine the nitrogenous substance which these chemists prepared from almonds, this legumine differs from the body prepared from the beans which Rochleder analyzed, not simply in as much as the former is soluble in acetic acid, whilst the latter is insoluble in this menstruum, but, moreover, in this, that the legumine prepared from almonds contains eighteen per cent. of nitrogen, whilst that prepared from beans and peas contains only 15.78 per cent. of this element. If fibrine, albumine, or caseine, are dissolved, as Mulder states, in moderately concentrated potass ley, and the solution is subsequently neutralized with acetic acid, the precipitate produced is *not* proteine free from sulphur, as Mulder believes. I, myself, have examined a solution of this kind, and I found that it does not turn black when mixed with solution of sugar of lead, and consequently contains no sulphuret of potassium, and also that acetic acid evolves no sulphuretted hydrogen from it. If the white precipitate produced by the addition of acetic acid to the solution is washed and subsequently dissolved in potass, and the solution is then boiled, the addition of a drop of solution of sugar of lead imparts an inky tint to the fluid, owing to the formation of sulphuret of lead. The precipitate, consequently, is *not* proteine. This deportment, therefore, does not warrant the conclusion that the substance which Rochleder analyzed was sulphate of proteine.

If soaked and finely bruised peas, stirred into a thin paste with ammoniated water, be passed through a filter, and the filtrate be precipitated with acetic acid, the precipitate produced subsequently dissolved in potass ley, and the solution boiled, supersaturation with an acid will give rise to a copious evolution of sulphuretted hydrogen, and the addition of salts of lead will produce a precipitate of sulphuret of lead.

The nitrogenous constituent of the pea, to which I assigned the name of vegetable caseine, is, therefore, not free from sulphur, as Mulder maintains. That this substance does not differ in composition from other nitrogenous and sulphuretted vegetable substances is sufficiently proved by the simple fact that peas contain everything requisite for the formation of the blood, and consequently for the sustenance of life. If the nitrogenous constituent of the pea were free from sulphur, how could it form blood, fibrine, and albumine? It is my opinion, moreover, that the mode of formation of proteine requires a new and more searching investigation. I have not succeeded as yet in producing a non-sulphuretted substance possessing the composition and properties of the so-styled proteine, according to the data and instructions given by Mulder.

Might it please M. Mulder to give a minute and circumstantial description of his process.*—*Lancet.*

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* Dr. Laskowski, who is at present engaged in the Giessen laboratory, in investigating the supposed products of the desulphuration of caseine, albumine, and fibrine, by caustic potass, has made a series of experiments with the precipitates produced by neutralising the potass solution of caseine, albumine, or fibrine, with acetic acid: he dissolved these precipitates in solution of potass and kept the fluid in ebullition for several hours, and yet the subsequent neutralization with an acid gave rise to the evolution of sulphuretted hydrogen; the same was the case when the precipitate had been fused with dry caustic potass, and even with precipitate, which, upon ebullition with potass ley, and addition of a drop of solution of sugar of lead, yield no pre-

FARADAY'S RESEARCHES IN ELECTRICITY.

(*From the Literary Gazette.*)

Royal Society, Jan. 8*th and* 15*th.*—The Marquess of Northampton, President, in the chair. The following paper was read: "Experimental Researches in Electricity," by Mr. Faraday. Twentieth Series. Section 26th. "On new magnetic actions; and on the magnetic condition of all matter."

The following is the order in which the several divisions of the subject treated of in this section of the author's researches in electricity succeed one another:—1. Apparatus required. 2. Action of magnets on heavy glass. 3. Action of magnets on other substances acting magnetically on light. 4. Action of magnets on the metals generally. 5. Action of magnets on the magnetic metals and their compounds. 6. Action of magnets on air and gases. 7. General considerations.

In giving an account of the contents of this paper, any attempt to follow the track of the author in the precise order in which he relates the consecutive steps of his progress in this new path of discovery, would fail of accomplishing its object: for, by adhering to such a course, it would scarcely be possible to comprise within the requisite limits of an abstract the substance of a memoir extending, as the present one does, to so great a length, and of which so large a portion is occupied with minute and circumstantial details of experiments; or to succeed in conveying any clear and distinct idea of the extraordinary law of nature brought to light by the author, and of the important conclusions which he has deduced.

One of the simplest forms of experiment in which the operation of this newly-discovered law of magnetic action is manifested, is the following:—A bar of glass, composed of silicated borate of lead, two inches in length, and half an inch in width and in thickness, is suspended at its centre by a long thread, formed of several fibres of silk cocoon, so as to turn freely, by the slightest force, in a horizontal plane, and is secured from the agitation of currents of air by being enclosed in a glass jar. The two poles of a powerful electro-magnet are placed one on each side of the glass bar, so that the centre of the bar shall be in the line connecting the poles, which is the line of magnetic force. If, previous to the establishment of the magnetic action, the position of the bar be such that its axis is inclined at half a right angle to that line, then, on completing the circuit of the battery so as to bring the magnetic power into operation, the bar will turn so as to take a position at right angles to the same line; and, if disturbed, will return to that position. A bar of bismuth, substituted for the glass bar, exhibits the same phenomenon, but in a still more marked manner. It is well known that a bar of iron, placed in the same circumstances, takes a position coincident with the direction of the magnetic forces, and therefore at right angles with the position taken by the bar of bismuth subjected to the same influence. These two directions are termed by the author *axial* and *equatorial*, the former being that taken by the iron, and the latter that taken by the bismuth.

Thus it appears that different bodies are acted upon by the magnetic forces in two different and opposite modes; and they may accordingly be arranged in two classes; the one, of which iron is the type, constituting those usually denominated *magnetics;* the other, of which bismuth may be taken as a type, obeying a contrary law, and therefore coming under the generic appellation of *diamagnetics*. The author has examined a vast variety of substances, both simple and compound, and in a solid, liquid, or gaseous form, with a view to

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cipitate of sulphuret of lead. It may not be without interest to remark here that the oxide of caseine of Prout (not the leucine of Mulder) contains sulphur. I have convinced myself of this by actual experiments made with a small portion of this substance, for which I was indebted to the kindness of Mr. Walter Crum.—J. Liebig.

ascertain their respective places and relative order with reference to this classification. The number of simple bodies which belong to the class of magnetics is extremely limited, consisting only of iron, which possesses the magnetic property in an eminent degree, nickel, cobalt, manganese, chromium, cerium, titanium, palladium, platinum, and osmium. All other bodies, when either solid or liquid, are diagmetic; that is, obey the same law, with regard to magnetic action, as bismuth, but with various degrees of intensity: arsenic is one of those that give the feeblest indications of possessing this property. The following exhibit it in increasing degrees, according to the order in which they are here enumerated; namely, ether, alcohol, gold, water, mercury, flint glass, tin, lead, zinc, antimony, phosphorus, bismuth. On the other hand, no gaseous body of any kind, or in any state of rarefaction or condensation, affords the slightest trace of being affected by magnetic forces. Gases may therefore be considered as occupying the neutral point in the magnetic scale, intermediate between magnetic and diamagnetic bodies.

The magnetic properties of compound bodies depend on those of their elements; and the bodies are rendered either magnetic or diamagnetic, according to the predominance of one or other of these conditions among their constituent parts. Thus iron is found to retain its magnetic power when it has entered into combination with other bodies of the diamagnetic class; the two forces acting in opposition to one another, and the resulting effect being only that due to the difference in their power. Hence the oxides and the salts of iron are still in a certain degree magnetic, and the latter even when they are held in solution by water; but the water may be present in such a proportion as that neither shall prevail; and the solution, as far as respects its magnetic properties, will then be exactly neutralised. These saline solutions, prepared of various degrees of strength, also afford a convenient method of comparing the relative degrees of force, both magnetic and diamagnetic, of different bodies, whether solid or fluid, but more especially the latter, as they admit of the body under examination being suspended in another liquid, when its position of equilibrium will indicate which of the two substances has the strongest magnetic power.

In one respect, indeed, the diamagnetic action presents a remarkable contrast with the magnetic; and the difference is not merely one of degree, but of kind. The magnetism of iron and other magnetics is characterised by polarity; that of diamagnetics is devoid of any trace of polarity; the particles of two bodies of the latter class, when jointly under the influence of the magnetic forces, manifesting towards each other no action whatever, either of attraction or repulsion. It has long been known that the magnetism of iron is impaired by heat; and it has been generally believed that a certain degree of heat destroys it entirely. The author finds, however, that this opinion is not correct; for he shows that, by applying more powerful tests than those which had been formerly confided in, iron, nickel, and cobalt, however high their temperature may be raised, still retain a certain amount of magnetic power, of the same character as that which they ordinarily possess. From the different temperatures at which the magnetic metals appear to lose their peculiar power, it had formerly been surmised by the author that all the metals would probably be found to possess the same character of magnetism, if their temperature could be lowered sufficiently: but the results of the present investigation have convinced him that this is not the case; for bismuth, tin, &c., are in a condition very different from that of heated iron, nickel, or cobalt.

The magnetic phenomena presented by copper and a few other metals are of a peculiar character, differing exceedingly from those exhibited by either iron or bismuth, in consequence of their being complicated with other agencies, arising from the gradual acquisition and loss of magnetic power by the iron core of the electro-magnet, the great conducting power of copper for electric currents, and its susceptibility of being acted upon by induced currents of magneto-electricity, as described by the author in the first and second series of these researches. The resulting phenomena are to all appearance exceedingly singular and anomalous, and would seem to be explicable only on the principles referred to by the author.

Pursuing his inductive inquiries with a view to discover the primary law of magnetic action from which the general phenomena result, the author noticed the modifications produced by different forms given to the bodies subjected to experiment. In order that these bodies may set either axially or equatorially, it is necessary that their section, with reference to the plane of revolution, be of an elongated shape: when in the form of a cube or sphere they have no disposition to turn in any direction: but the whole mass, if magnetic, is attracted towards either magnetic pole; if diamagnetic, is repelled from them. Substances divided into minute fragments, or reduced to a fine powder, obey the same law as the aggregate masses, moving in lines, which may be termed *diamagnetic curves*, in contra-distinction to the ordinary magnetic curves, which they every where intersect at right angles. These movements may be beautifully seen by sprinkling bismuth in very fine powder on paper, and tapping on the paper while subjected to the action of a magnet.

The whole of these facts, when carefully considered, are resolvable, by induction, into the general and simple law, that while every particle of a magnetic body is attracted, every particle of a diamagnetic body is repelled, by either pole of a magnet. These forces continue to be exerted as long as the magnetic power is sustained, and immediately cease on the cessation of that power. Thus do these two modes of action stand in the same general antithetical relation to one another as the positive and negative conditions of electricity, the northern and southern polarities of ordinary magnetism, or the lines of electric and of magnetic force in magneto-electricity. Of these phenomena, the diamagnetic are the most important, from their extending largely, and in a new direction, that character of duality which the magnetic force was already known, in a certain degree, to possess. All matter, indeed, appears to be subject to the magnetic force as universally as it is to the gravitating, the electric, the cohesive, and the chemical forces. Small as the magnetic force appears to be in the limited field of our experiments, yet when estimated by its dynamic effects on masses of matter, it is found to be vastly more energetic than even the mighty power of gravitation, which binds together the whole universe: and there can be no doubt that it acts a most important part in nature, and conduces to some great purpose of utility to the system of the earth and of its inhabitants.

Towards the conclusion of the paper, the author enters on theoretical considerations suggested to him by the facts thus brought to light. An explanation of all the motions and other dynamic phenomena consequent on the action of magnets on diamagnetic bodies might, he thinks, be offered on the supposition that magnetic induction causes in them a state the reverse of that which it produces in magnetic matter; that is, if a particle of each kind of matter were placed in the magnetic field, both would become magnetic, and each would have its axis parallel to the resultant of magnetic force passing through it; but the particle of magnetic matter would have its north and south poles opposite to, or facing, the contrary poles of the inducing magnet; whereas, with the diamagnetic particles, the reverse would obtain; and hence there would result in the one substance approximation, in the other recession. On Ampère's theory, this view would be equivalent to the supposition that, as currents are induced in iron, and magnetics parallel to those existing in the inducing magnet or battery-wire, so, in bismuth and other diamagnetics, the currents induced are in the contrary direction. As far as experiment yet bears upon such a notion, the inductive effects on masses of magnetic and diamagnetic metals are the same.

PREPARATION OF VALERIANIC ACID, AND THE VALERIANATES.

BY MESSRS. CAP, LOURADOUR, AND BLONDEAU.

The authors having been appointed to examine the different processes which have been proposed for the preparation of the above substances, give the following statement in their report:—

M. Righini agrees with MM. Cahours, Dumas, and Dœbereiner, that the liquid oil of valerian is an oxyacid, the base of which is a ternary radical, which he calls *valerianolle*. He shows that this oil is formed of two parts, the one fixed and unaltered by cold, the other congealed at a temperature below 32° Fahr.

The former of these, treated with magnesia, introduced into a retort with solution of tartaric acid, and distilled, yields pure valerianic acid.

M. Righini, adopting a more economical process, submits an alcoholic solution of oil of valerian to a low temperature. The solid part (hydruret of carbon, stearoptine, or valerianine), is deposited, and the valerianic acid remains dissolved in the alcohol. The alcohol is separated by distillation, and the oleaginous valerianic acid remains.

On treating the solidified portion of the oil of valerian with lime, and decomposing it with sulphuric acid, pure valerianic acid is obtained by distillation; the odour of which bears some analogy to English oil of mint.

M. Righini also considers that the valerianic acid does not exist in a free state in the valerian root, and is only developed under the influence of certain physico-chemical causes.

M. Lepage, of Gisors, has proposed the following process for obtaining valerianic acid:—He macerates valerian root, well bruised, with water acidulated with from 300 to 400 grains of sulphuric acid to every thirty-two ounces of the root operated upon; it is afterwards pressed, and the liquor saturated with carbonate of lime, added in small quantities at a time, until effervescence ceases, and the liquor no longer reddens litmus paper; it is then put over the fire, and constantly stirred until it boils. The liquor is filtered while still hot, and evaporated over a water-bath until it attains a syrupy consistence. Crystals of valerianate of lime are formed on cooling, which are not removed for several days, and which may then be pressed and purified by animal charcoal, to render them white.

On decomposing this valerianate of lime with oxalic acid, valerianic acid is obtained, in a diluted state, but this may be used for making any of the valerianates required.

We have repeated this process with the greatest care, but unfortunately the results do not confirm the statement of M. Lepage; a small quantity only of confused crystals were found attached to the dish, and in quantity so small that they could not be detached and submitted to purification.

We were concluding our investigations when we read in a scientific journal, of a mode of preparing valerianate of zinc closely resembling that generally adopted, but which would be preferable, if the valerianate, which is obtained in large quantity, should prove to be pure. M. Vuaflart states, that he obtained from 60 to 75 grains of valerianate of zinc from thirty-two ounces of the root, while on the other hand, M. Brun Buisson says, that 225 grains may be obtained from the same quantity of root, by the following process:

Macerate thirty-two ounces of bruised valerian root, with water acidulated with three ounces of sulphuric acid, for two days; then distil as long as any acid reaction is afforded by the product. This distilled water is to be exposed to the air for a month, after which it is to be put into a matrass with 225 grains of recently precipitated oxide of zinc, and allowed to digest on a sand-bath for eight or ten hours, heated to 176° Fahr., and stirred from time to time; it is to be filtered while warm, and being evaporated to three-quarters, the remainder is to be poured on earthenware plates, and dried in a stove. The product of this operation will be 225 grains of valerianate of zinc, in shining scales, which are said by M. Buisson to be in a state of perfect combination.

M. Soubeiran had already expressed an opinion that the essential oil of valerian may be transformed into valerianic acid by oxidation, and that by the use of oxidizing agents a larger quantity of the acid would probably be produced than had hitherto been the case. The investigation of M. Buisson confirms this suspicion, and his process deserves to be repeated.—*Journal de Pharmacie et de Chimie.*

TEST FOR THE PRESENCE OF A CARBONATE IN THE BICARBONATE OF AN ALKALI.

BY M. COTTERAU.

Chevallier, some years ago, proposed the use of potash as a means of detecting the presence of the sugar of fecula when mixed with cane-sugar. The reaction which takes place, is indicated by the production of a red or yellow colour, according to the quantity of sugar of fecula present. To the experiments of this Chemist, I may add the following:

1st. All the alkalies produce the same effect, as was observed by M. Chevallier in the case of potash, when in contact with sugar of fecula. Ammonia does not offer an exception to the rule.

2d. All the alkaline carbonates also produce the same effect; but with carbonate of lime the effect is very feeble.

3d. The bicarbonates of the alkalies, under similar circumstances, do not produce any change of colour.

It follows from this that a neutral alkaline carbonate may be easily distinguished from a bicarbonate by the action of sugar of fecula; and by the same means the admixture of a carbonate with a bicarbonate may be detected.

In all cases the application of heat greatly promotes the reaction alluded to.—*Journal de Chime Médicale.*

CAOUTCHOUC,
A REMEDY FOR PHTHISIS!

Common salt was at one time regarded as a sovereign remedy against phthisis in all its stages; but it has resumed its old station as a culinary article, and is now beneficially employed only by cooks. Cod-liver oil succeeded the saline treatment, but this appears to be gradually losing ground, and before long will probably share the fate of common salt. A Presburg physician has, however, contrived to stumble upon a remedy which certainly has the merits of novelty and *originality* over the two above plans of treatment. This is the inward use of *caoutchouc* or Indian-rubber as a therapeutical agent. According to the account given by its discoverer, its powers are marvellous. A boy twelve years of age labouring under hectic fever, swallowed by mistake two drachms of caoutchouc; in six weeks he was perfectly cured. A woman aged thirty-eight, who was in a very advanced stage of phthisis, having been informed of the above mentioned result, stole some pieces of caoutchouc and swallowed them: her symptoms became speedily alleviated. The caoutchouc was repeated, and she was perfectly cured!—*Gaz. Medicale and Medical Gazette.*

TEST FOR SULPHUROUS ACID.

BY M. HEINTZ.

The following very characteristic test, is recommended by M. Heintz, for detecting the minutest trace of sulphurous acid. The substance to be examined, dissolved in water or in hydrochloric acid, is heated, with a solution of protochloride of tin in hydrochloric acid, until the solution boils. If the solution contained much sulphurous acid, sulphuret of tin will be precipitated; if, on the other hand, the sulphurous acid was present only in minute quantity, there will be no precipitate formed, the liquid will be but slightly coloured yellow, and it will acquire the smell of sulphuretted hydrogen. The addition now, of a few drops of solution of sulphate of copper will immediately afford a brown precipitate of sulphuret of copper.

This method of detecting the presence of sulphurous acid, it will be perceived, is but a modification of that proposed more than fifty years ago by Pelletier, and since recommended by M. Girardin.

It is a better process than that of MM. Fordos and Gelis, which is founded on the formation of sulphuretted hydrogen by the contact of metallic zinc and sulphurous acid gas, inasmuch as no apparatus is required for the disengagement of the gas.—*Journal de Pharmacie.*

PREPARATION OF LACTATE OF IRON.

BY P. H. LEPAGE.

The preparation of this salt of iron, now so frequently employed in medicine, consists, as is known, in acting on iron filings, perfectly free from oxide, with dilute lactic acid. The operation is usually conducted in a matrass heated in a sand-bath, and the product thus obtained is quite unexceptionable. Nevertheless, this process is a tedious one; in the first place, it is necessary previously to prepare the lactic acid; secondly, the re-action of this diluted acid on the iron filings, although assisted by heat, is slow. With the view of obviating these two objections, I propose the following process, which I have found to yield quite as good a product, with the advantage of being much more expeditious.

Take of Lactate of Lime	100 parts
Boiling Water	500 "

Dissolve and filter. Then

Take of Sulphate of Iron, crystallized	68 parts
Cold Distilled Water	500 "

Dissolve and filter.

Mix the two clear solutions in a matrass, slightly acidulate the mixture with lactic acid, and heat it over a water-bath, with agitation, until the decomposition is complete. The matrass is now to be removed from the water-bath, the liquor rapidly filtered to separate the sulphate of lime, and then evaporated quickly, with the addition of a small quantity of iron filings. When reduced to about half its volume, it is again to be filtered and allowed to crystallize. On the further evaporation of the mother-liquor, a new crop of crystals may be obtained. The crystals thus obtained are to be put into a funnel washed with a little alcohol, and allowed to drain, and dried on bibulous paper.

The salt thus obtained is white; its solution in distilled water is not rendered turbid by nitrate of bayta, or by oxalate of ammonia.—*Journal de Chemie Médicale.*

GUTTA PERCHA,
A PECULIAR VARIETY OF CAOUTCHOUC.

BY DR. MACLAGAN.

GUTTA Percha is the Malayan name for a substance which is the concrete juice of a large forest tree, a native of the shores of the straits of Malacca, Borneo, and the adjacent countries. The tree yielding it is unknown botanically, all the information we possess regarding it being, that it is a large forest tree, and yields this product abundantly. We are indebted for our knowledge of it to Dr. Montgomerie, H. E. I. C. S., whose spirited exertions to improve the cultivation of various articles of colonial produce at Singapore have obtained for him several distinguished marks of approbation from the Royal Society of Arts of London. For his communication regarding gutta percha, Dr. Montgomerie received a silver medal from the society.

This substance in its crude state differs in many particulars from common caoutchouc; it is of a pale yellowish, or rather dirty white colour; it is nearly as hard as wood, though it readily receives the impression of the nail. It is very tenacious, and not at all elastic.

It seemed to me to be worth while to determine whether or not this substance really was a variety of caoutchouc, and for this purpose I subjected it to the ordinary process of ultimate analysis, and obtained as its per centage composition, carbon 86.36; hydrogen 12.15; the remainder, 1.49, was most probably oxygen absorbed from the air during the process employed for purifying it, as the substance, whilst heating on the vapour-bath, acquired a brown colour. The only analysis of common caoutchouc with which I am acquainted is that of Faraday, who obtained, carbon 87.2; hydrogen 12.8. The results are sufficiently near to warrant the conclusion that the two matters in question are generically the same.

I also found that the gutta percha yields the same product of destructive distillation as the common caoutchouc. Without entering into details, I may briefly state, that both equally yield a clear yellow limpid oil, having no fixed boiling point, and therefore being a mixture of different oleaginous principles. In both instances the distillation proceeds most freely at temperatures between 360° and 390° Fahr.; and seems almost stationary at 385°. Comparative analyses of several portions of the two oils were made, and, as is already known of common caoutchouc, the products exhibit a constitution represented by the formula $C_{10}\ H_8$. The gutta percha thus appears really to be a modification of caoutchouc.

In its general properties it likewise shows a similarity to common caoutchouc. It is soluble in coal naptha, in caoutchouc oil, and in ether. It is insoluble in alcohol and in water, and floats upon the latter. Its most remarkable and distinctive peculiarity is the effect of heat upon it. When placed in water at 110°, no effect is produced upon it, except that it receives the impression of the nail more readily; but when the temperature is raised to 145° or upwards, it gradually becomes so soft and pliant as to be capable of being moulded into any form, or of being rolled out into long pieces or flat plates. When in the soft state, it possesses all the elasticity of common India-rubber, but it does not retain these properties long; it soon begins again to grow hard, and in a short time, varying according to the temperature and the size of the piece operated on, regains its original hardness and rigidity. A ball one inch in diameter was completely softened by boiling water in ten minutes, and regained its hardness completely in less than half an hour. It appears to be capable of undergoing this alternate softening and hardening any number of times without change of property.

It is also to a certain extent ductile. When soft it is easily torn across, but when hard it is very tenacious. A piece not the eighth of an inch in thickness, when cold, easily raised a weight of 42lbs, and only broke when half a hundred weight was attached to it.

From these properties, it seems capable of many applications in the arts. Its solution appears to be as well adapted as that of common caoutchouc for making waterproof cloth; and whilst softened, it can be made into solid articles, such as knife-handles, door-handles, &c. Malays employ it for the former of these, and prefer it to wood. A surgeon, furnished with a small piece, could easily, with the aid of a little hot water, supply himself with bougies or pessaries of any size or form.—*Edinburgh Philosophical Journal and Chemical Gazette.*

HOW TO CONDUCT A PATHOLOGICAL ANALYSIS OF THE BLOOD.

1. A bottle containing exactly 1000 grains of water is filled with blood directly from the vein; a glass stopper fitting hermetically is then inserted (care being taken to remove all bubbles), and the specific gravity of the blood ascertained. By continually shaking it, the blood is kept fluid; it is then poured into a porcelain vessel and evaporated, care being taken to wash the glass out with distilled water, and add the latter to the other. The quantity of solid residue is reduced to the proportions in 1000 grains of blood.

2. A glass two and a half ounce measure, is filled with the blood immediately after the preceding, covered and set aside for eighteen hours. The clot is then carefully separated from the serum, and the weight of both ascertained.

3. The clot is now to be pressed in a linen cloth four inches square, and first the fibrine, then the fluid cruor collected. Each is thoroughly washed, freed from moisture, and weighed; they are then carefully dried, and again weighed. The results are to be reduced to the proportion in 1000 grains of blood.

4. The serum and clot are to be placed in a glass containing 360 grains of distilled water, and their specific gravity noted; then 250 grains of each, at the same temperature, are to be dried so long as they lose weight; the weight of the residuum is then to be reduced to the proportion of 1000 grains. There is a loss of weight by pressure through the linen, but as this will happen in the same proportion in all instances, the general results are correct.

Dr. Zimmermann observes, that this method will be more suitable to the practical physician than Andral and Gavarret's, because of its greater simplicity and easier performance, while the results are quite as correct as by the latter method.—*British and Foreign Review.*

SINGULAR PROPERTY OF CAMPHOR.

The specific gravity of camphor is usually given at from 0.985 to 0.996, and it therefore floats on water. In all chemical works this substance is said to be lighter than water. According to Dr. Gregory, Dr. Christison has a fine specimen of Borneo camphor (*Dryabalanops Camphora*), consisting of small fragments, which are heavier than water. The common camphor, which is obtained from Japan (*Laurus Camphora*), varies much in specific gravity according to temperature—a fact which does not seem to have been hitherto noticed. Small pieces, which have been for some time digesting in water, float readily at a temperature of 60°; but when the water is cooled to near the freezing point, they sink. The following are the results of some experiments on the subject. At from 32° to 33°, the pieces of camphor readily sank in water, and remained at the bottom of the vessel. At 45°

the pieces were in a mean condition, having an equal tendency to rise or fall. At 54°, they entirely floated. It is difficult to give an explanation of these facts, unless we suppose that the substance contracts and expands in a much greater ratio than water, by a few degrees difference of temperature, for it floats when the water has the least density, and sinks when it has the greatest.

Thus it sinks at from 32° to 33°, the density of water being 1.000
Mean condition 45° .... .9996
Floats at 54° .... .9992

These changes in the density of water are taken from a table given by Muncke in his *Handbuch der Naturlehre.—Medical Gazette.*

PÂTE DE GUIMAUVE (OR PÂTE DE GOMME).

Take of gum Arabic 1 lb.; white sugar 1 lb.; water 8 ozs.; orange-flower water 2 ozs.; white of eggs 6.

Dissolve the gum in the water in a water-bath, and evaporate to the consistence of thick honey.

Beat the white of egg thoroughly with the orange-flower water, and add it by small portions at a time to the gum, retaining it on the fire, and stirring constantly until the whole is reduced to such a consistence that it will not adhere to the back of the hand. Then roll it out on a board with starch.—*French Codex.*

PASTILLES DE GUIMAUVE.

Take of marsh-mallow root in powder one part; white sugar seven parts; mucilage of gum tragacanth q. s. Divide into lozenges of sixteen grains.

ANOTHER FORMULA.

Marsh-mallow root 2 ozs.; water sufficient to make a decoction. Strain the decoction and evaporate to 12 drachms. Add gum tragacanth 1 drachm (in the form of mucilage); white sugar 16 ozs. Divide into lozenges of twelve grains.

ANOTHER FORMULA.

Take of marsh-mallow root in powder ½ oz.; orris root 1 drachm; white sugar 8 ozs.; mucilage of tragacanth q. s.. Divide into lozenges.—*Pharmacopée Universelle.*

PÂTE DE JUJUBES.

Take of jujubes (Zizyphus vulgaris) 1 lb.; gum Arabic 6 lbs.; white sugar 5 lbs.; orange-flower water 6 ozs.

Boil the jujubes for half-an-hour in 4 lbs of water; express and allow it to subside. Decant the clear liquor.

Wash the gum in cold water, then add 8 lbs. of cold water. Allow it to dissolve cold, and strain.

Put the decoction of jujubes in a pan and clarify it with the whites of three or four eggs. Add the solution of gum, and warm it, stirring constantly with a wooden spatula. When it boils, leave off stirring and keep up a gentle ebullition. When the paste has acquired the consistence of a soft extract, add the orange-flower water and plunge the pan in another pan containing boiling water. In twelve hours remove the scum, and pour the paste in moulds of iron coated with mercury. Continue the evaporation in a stove at 104 F. Replace it in the moulds as soon as it is sufficiently firm, and leave it in the stove until it is of a proper consistence.

PÂTE DE LICHEN.

Take of Iceland moss 1 lb.; gum Arabic 5 lbs.; white sugar 4 lbs. Place the lichen in a pan with a sufficient quantity of water, and raise it nearly to the boiling point. Reject the liquor, and boil the lichen for an hour, in fresh water. Add to the liquor the gum and sugar; dissolve and evaporate at a moderate temperature to a firm consistence. Roll it out on a marble slightly oiled, and when cold wipe off the oil adhering to it.

PÂTE DE LICHEN OPIACÉE.

To the above add one drachm of extract of opium. Each ounce contains half-a-grain.—*Pharmacopée Universelle.*

PHENOMENON OBSERVED IN THE MANUFACTURE OF CARBONATE OF LEAD.

BY M. PAYEN.

In the pits where, during thirty or forty days, the lead oxidizes and becomes converted into carbonate, under the combined influences of air, temperature, vapour of water, acetic and carbonic acids, carbonate of ammonia, &c., the oak beams and deal boards, which separate the different layers, undergo a great alteration, which the manufacturers consider to be a true carbonization.

The wood, after having been used eight or ten times, presents the exterior characters of charcoal; black or brown, light, easily broken, and burning with scarcely any flame.

Notwithstanding all these appearances, I judged, from previous observations on the composition of wood and the changes which it undergoes, that the product of this special alteration in the white lead pits must be more complex than was supposed.

Guided by these inductions, I was soon enabled to arrive at the following facts:—

1st. The product called *charcoal of the white lead pits*, does not contain any quantity of free carbon.

2d. In this product, the incrusting matter of the ligneous fibres has been transformed into a brown substance soluble in water, containing ammonia in combination, and which is precipitated by acids; and into three other substances soluble in alkalies, from which they are isolated by acids and by special solutions.

On treating some of the *charcoal of the white lead pits* successively with ether, water, ammonia, potash, &c., as long as these liquids dissolved any thing, the following products were obtained:—

Fatty matter, dissolved by ether	0.20
Brown substance, soluble in water	22.55
Brown substance, dissolved by solution of ammonia	21.45
Brown substance, dissolved by boiling solution of potash	39.00
Altered vegetable tissue	9.80
Acetate of ammonia	1.00
Sand, salt of potash, earthy matter, phosphate of lime, and sulphate of lead	6.30
	100.

The four first substances are dissolved by boiling solution of caustic potash.

A piece of deal, altered under the same influences, differs in the proportions of the substances soluble in ether and alcohol; exhausted successively by these liquids, aided by a continuous distilling and filtering apparatus, it yields a fatty matter, which washed, dried, and treated with alcohol, furnishes another substance of about the consistence of wax, fusible below 172° Fahr., floating on hot water, and burning with a very luminous flame.

After exhaustion by ether, the same wood treated with alcohol gives a brown substance, of the consistence of fat, crystallizable, and easily fused. There is thus obtained from 49 grammes, by means of ether, 0.795. Of this, water dissolves 0.435; the remaining 0.360 were found to consist of

0.231	of a substance having the consistence of wax	= 5.47 per cent.
0.129	of a fatty matter dissolved by boiling alcohol	= 1.79 per cent.
0.750	of a crystalline fatty matter, extracted by the direct action of alcohol	
1.110		7.26

3d. The primitive cells of the wood, less altered in this product, resist the action of water and alkaline solutions, so that their transverse sections show under the microscope a tissue but little, if at all, incrusted.

4th. The translucent cellulose, which forms the base of the remainder of the tissues, is altered; yet it presents the characters of the structure of the vegetable tissue, the cuticle, and the cells of the epidermis, which, also filled with azotised matter, resist the action of sulphuric acid in the presence of iodine, producing an orange colour, without subsequently developing the blue or violet colour which characterises pure cellulose.

5th. The whole of these substances constitute the *charcoal of the white lead pits.*

6th. The azote is found partly combined in the form of ammonia, which is disengaged abundantly at a temperature of 266° Fahr.; but this temperature, and especially that at which carbonization would be effected, could not be attained in these pits.

7th. An ultimate analysis of some of the *charcoal of the white lead pits*, gave the following results:—

Carbon..............................	54.65
Hydrogen	4.77
Oxygen..............................	32.48
Nitrogen	8.10

It differs from ordinary oak-wood in containing a larger proportion of carbon in relation to the hydrogen and oxygen, and a much larger proportion of nitrogen.

This composition may be explained by the formation of several brown acids, containing a considerable part of the carbon and oxygen of the wood, and the combination of these acids with ammonia contained in the vapours. In fact, it would result from the combustion of a part of the hydrogen, and the elimination of a certain quantity of the elements of water.

We have seen from the results of the analyses, that the organic substance examined contains more carbon and less hydrogen than wood; but in order to form a more correct idea of this composition, it is better to separate it into two distinct parts—on one hand the azote, in the form of ammonia; on the other, the three other elementary constituents; we then arrive at the following results:—

Carbon	61.34
Hydrogen..........................	2.21
Oxygen..............................	36.45
	100.

This composition, rich in carbon, and presenting a large excess of oxygen, as compared with the hydrogen, ought to resemble the composition of the three brown acids, and perhaps one of them containing less hydrogen might be expected to contain the elements of oxalic acid.

Want of time has not yet permitted me to make this research. I was anxious at least to ascertain whether the combination soluble in water, and forming 0.2145 of the rough charcoal, or 0.2584 of the three brown matters, contained a notable quantity of ammonia, and this I found from analysis to be the case.—*Annales de Chemie et de Physique.*

NOTICES OF BOOKS.

JORNAL DA SOCIEDADE PHARMACEUTICA LUSITANA. Tomo iv. No. 1, 8vo, *Lisboa*, 1845. [JOURNAL OF THE PORTUGUESE PHARMACEUTICAL SOCIETY.]

IN 1836 the Pharmaceutical Society of Lisbon published the first number of its journal, under the title of the *Jornal da Sociedade Pharmaceutica de Lisboa.* The journal appeared somewhat irregularly; for the first volume, consisting of twelve numbers and a supplement, was not completed until the year 1838. The second volume, consisting of twelve numbers and a supplement, was commenced in 1838, under the title of *Jornal da Sociedade Pharmaceutica Lusitana,* but was not completed until 1839. A suspension of the publication during two years then appears to have taken place, for all the thirteen numbers of the third volume are dated 1842; and the first number of the fourth volume, now before us, is dated 1845.

According to the report contained in the last-received number of the journal, it appears that the Portuguese Pharmaceutical Society consisted, in 1845 (the tenth year of its existence), of 348 members, thus arranged:—

Protectores	2
Benemeritos	6
Honorarios	68
Effectivos	85
Correspondentes Nacionaes	180
Correspondentes Estrangeiros	7
	348

The *Protectores,* or Patrons, are Her Majesty D. Maria II., and Her Royal Consort D. Fernando II.

The journal is respectably got up; but it consists principally of matters of domestic interest to Portuguese Pharmaceutists, and of translations from the French Journals.

In the last number of the journal is an interesting paper on the *Momordica Bucha,* commonly called *Cabacinho* or *Bucha,* by the inhabitants of Pernambuco. The plant is, we apprehend, the *Luffa purgans* of Martius, of which two notices have already appeared in our journal [*Pharmaceutical Journal* for February and April, 1845]. We propose, however, on a future occasion, to lay before our readers a brief abstract of the paper on this subject from the Portuguese journal.

CODIGO PHARMACEUTICO LUSITANO, OU TRATADO DE PHARMACONOMIA, *no qual s'explicão as regras e preceitos com que se escolhem, conservão e prepárão os Medicamentos; e se apresentão as virtudes, usos e dóses das fórmulas Pharmaceuticas.* POR AGOSTINHO ALBANO DA SILVEIRA PINTO. *Coimbra,* 1835. 8vo. [THE PORTUGUESE PHARMACEUTICAL CODE, OR TREATISE

ON PHARMACONOMIA, *explaining the Rules and Precepts for the selection, conservation, and preparation of Medicines; and exhibiting the virtues, uses, and doses of the Pharmaceutical Formulæ.*]

The nature and objects of the work are fully explained by the title. The book is divided into three parts. The first, or preliminary part, treats of pharmaceutical utensils, physical instruments, chemico-pharmaceutical operations, &c. The second or technical part, treats of the selection, collection, conservation, and preparation of medicines. The remainder of the work consists of the Pharmacopœia, and occupies 270 pages.

By a decree of the Queen, dated October the 6th, 1835, this work was declared to be the legal Pharmacopœia of Portugal.

PHARMACOGRAPHIA DO CODIGO PHARMACEUTICO LUSITANO. Por A. A. DA SILVEIRA PINTO. *Coimbra*, 1836. [THE PHARMACOGRAPHY OF THE PORTUGUESE PHARMACEUTICAL CODE.] 8vo, pp. 367.

The author divides this work into two parts. *Part the first* contains, in the first section, a synopsis of the ultimate and proximate chemical principles methodically arranged, and in the next section, secondary compounds are considered. *Part the second* commences with an introduction, containing an exposition of the artificial and natural systems of botany. The different substances of the vegetable Materia-Medica are then individually considered in the order of the Linnean artificial system. Each substance is briefly described, its chemical constituents stated, and its effects and uses very briefly mentioned. The dose is rarely stated. Altogether, the information which it contains is of a much less useful and practical nature than that given in Dr. A. T. Thomson's *Conspectus*.

1. PANDECTES PHARMACEUTIQUES, *ou Recueil de tous les Statuts, Edits, Lettres-Patentes, Déclarations, Arrêtés, Décrets, Lois, Ordonnances, Règlements, avis du Conseil d'Etat et du Conseil de l'Université, Circulaires Ministérielles, et Arrets concernant les Pharmaciens Civils et Militaires; Histoire des Colléges et des Ecoles de Pharmacie de France de* 1312 *a* 1837. Par M. ADOLPHE LAUGIER et M. VICTOR DURUY. *Paris*, 1837, 8vo., pp. 738. [PHARMACEUTICAL PANDECTS; *or Collection of all the Statutes, Edicts, Letters Patent, Declarations, Proclamations, Decrees, Laws, Ordinances, Regulations, Opinions of the Council of State and of the Council of the University, Ministerial Circulars and Proclamations concerning Civil and Military Pharmaciens; and History of the Colleges and Schools of Pharmacy in France from the year* 1312 *to* 1837.]

2. CODIGO EXPLICADO DOS PHARMACEUTICOS, *ou Commentario a'cerca das Leis e Jurisprudencia em Materia Pharmaceutica.* Por M. LATERRADE, Advogado no Tribunal Real de Paris. *Accrescentado comuma Collecção de Leis, Decretos, Alvaras, Portarias e Regimentos, que interessam e dizem respeito aos Pharmaceuticos Portuguezos. Traduzido, dedicado e offerecido á Sociedade Pharmaceutica, Lusitana, por* FRANCISCO BERNARDO DOS SANTOS. *Porto,* 1841, 8vo, pp. 420. [THE APOTHECARIES' CODE EXPLAINED; *or Commentary on the Laws and Jurisprudence of Pharmacy.* By M. LATERRADE. *To which is added a Collection of the Laws, Decrees, Charters, Orders, and Prescripts relating to Portuguese Apothecaries. Translated, dedicated, and presented to the Portuguese Pharmaceutical Society.*]

The titles of these works so fully explain their nature and objects, that it is scarcely requisite to make any observations thereon. We notice these books with a view to draw the attention of Pharmaceutists in this country to the existence of works fully explanatory of the laws relating to French and Portuguese Pharmacy.

The first 290 pages of the second of the above works consist of a Portuguese translation of the French regulations, laws, ordinances, &c., respecting Pharmacy, from the year 1666 to 1804; and the remainder of the work, consisting of more than 100 pages, contains the laws, decrees, charters, edicts, &c., relating to Portuguese Pharmacy, from 1794 to 1840.

THE VEGETABLE KINGDOM; *or the Structure, Classification, and Uses of Plants, illustrated upon the Natural System.* By JOHN LINDLEY, PH. D., F.R.S., and L.S., Professor of Botany in the University of London, and in the Royal Institution of Great Britain. *With upwards of* 500 *Illustrations.* 8vo, pp. 908. London: BRADBURY and EVANS, 90, Fleet Street, and Whitefriars.

This is a very voluminous and valuable work. We defer our notice of it until next month.

INSTRUCTIONS FOR MAKING UNFERMENTED BREAD; *with Observations.* By A PHYSICIAN. TAYLOR AND WALTON, Upper Gower Street.

TO CORRESPONDENTS.

Erratum.—In the last number, page 396, List of London Members, *for* W. Delatouche, 147, Strand, *read* 147, Oxford Street.

M. A. C.—We are not acquainted with a formula for tincture of camphor with castor and opium.

"Jacobus."—Alum precipitates the colouring matter from many vegetable decoctions.

F. L.—Ink stains may be discharged by oxalic acid.

R. L. D.—Carbonate of ammonia moistened with the strongest solution of ammonia and scented, forms the best smelling salts.

E. B.—It has been stated that the kind of soap alluded to is a potash soap made with lard.

J. R.—The reason for recommending that leech jars should be only one-third filled with water, is that the leeches may be enabled to crawl out of the water and suspend themselves by their suckers from the sides of the jar, which is found to be beneficial to their health.

G. P.—In scaling teeth cuttle-fish powder is sometimes used.

"An Associate," L. R.—(1.) We cannot give an opinion of a work which is not yet published.—(2.) We cannot recommend a work on the practice of medicine.—(3.) Hooper's *Medical Dictionary*.

A Correspondent, (Gosport).—We are surprised that any person should think of troubling a publisher to search through the pages of a periodical publication for twelve or fourteen articles, instead of ordering the work and looking for them himself.

G. S.—The subject will not be overlooked.

G. H. N.—We recommend Lindley's *Elements* or *Introduction to Botany* in preference to any dictionary of botanical terms that we know.

D. G.—(1.) Amides are compounds, supposed to contain amidogen (NH_2).—(2.) See vol. iii., page 365 to 369.

M. P. S.—*Liquor hydriodatis hydrargyri et arsenici*, see vol. ii., pages 469 and 516.

M. P. S., (Manchester).—*Tooth Cement*, see vol. iii., page 589.

"An Associate," P. S.—Two tablespoonfuls.

A Correspondent (post mark Carlisle), has forgotten to sign his name.

Advertisements to Mr. Churchill, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. Smith, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to The Editor, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. XI.—MAY 1st, 1846.

PHARMACEUTICAL LEGISLATION.

(*Continued from page* 434).

In order to be prepared with a definite and tangible proposition for the consideration of the legislature, the Council of the Pharmaceutical Society have thought it advisable to embody their views in the form of an Act of Parliament.

It would be useless to make any application to the Secretary of State, or to introduce the subject in the House of Commons, until we have agreed among ourselves as to the precise nature of the plan which we advocate; and the Council have therefore endeavoured, with the most deliberate consideration on their own part, and aided by the best legal advice, to produce the draft of a Bill calculated to attain the desired object without provoking hostility or opposition.

The first difficulty which presented itself was that of deciding in what manner and to what extent the Pharmaceutical Society should be made available in the furtherance of the object in view. The Society having been established as a step preliminary to the attainment of an Act of Parliament, the first plan which suggested itself was to make the present Society the basis of the proposed enactment. It appeared just and reasonable that those who have united and exerted themselves for the advancement of their profession and the benefit of the public, should be recognised as the founders of the new system, and invested with the powers requisite for carrying it into effect. If all the Chemists in the nation, or even a very large majority, had united in the undertaking, this course might have been free from objection; but although the most respectable members of our body in the metropolis and principal towns, are Members, the numerical strength of the Society is not in proportion to its moral influence, and there are a large number of persons whom the law would recognise as Chemists and Druggists, who have taken no part in the movement which has been in progress during the last five years. As no law could be introduced having a retrospective operation, all these persons might claim to be registered as Chemists and Druggists, and, on the supposition of the PHARMACEUTICAL SOCIETY becoming the governing body, they would all become Members, and as such would be admitted to a participation in the privileges of membership, without having contributed either to the labour or expense incurred. Thus the Members of the Society, instead of being benefited by such an arrangement, would be rather making a sacrifice, by sharing their distinction and privileges (including the advantage of the Benevolent Fund and the other property of the Institution) with every person who could claim by law to be considered a Chemist and Druggist.

In our number for March we mentioned the fact that, in order to adapt the PHARMACEUTICAL SOCIETY to the purposes of an Act of Parliament, its operations must be, in some respects, curtailed, as we could not expect to obtain a Bill entrusting the offices of education and examination to the same body. We also expressed the opinion that it would be advisable for the Society to continue to be an educating body, resigning the office of examination to a new College constituted on representative principles, and comprising all the Chemists already in business as its original Members. This opinion has been confirmed by the Council, and has been acted upon in the preparation of the draft of a Bill, which is now in a forward state. By the proposed arrangement, every person now in business as a Chemist will continue to possess all the privileges he now enjoys—the Members of the PHARMACEUTICAL SOCIETY will retain their present distinction, corporate privileges, and Benevolent Fund—the School of Pharmacy with its branch schools will continue to be carried on under the auspices of the Society—the proposed College of Pharmacy will conduct the examinations of future Chemists, and grant certificates of qualification to carry on the business.

The new College, by creating a demand for Pharmaceutical education, will give an impetus to the School of Pharmacy, and, at the same time, to every other school in which Chemistry and the collateral branches of science are taught, without conferring a monopoly on any particular institution. The competition between the several schools will have a salutary effect, and the emulation thus excited will lead to improvements in the system of education. Each school will depend for success on the merit of its regulations, and the spirit with which it is conducted, and the PHARMACEUTICAL SOCIETY, being the first in the field, and having organized its school expressly for the education of Pharmaceutical Chemists, will be likely to maintain its ground and compete successfully with other establishments.

We have heard a doubt expressed whether a sufficient inducement will exist for supporting the Society if the proposed arrangement should be carried into effect, it having been suggested that as many of the Members may have joined it in the anticipation that it would obtain Parliamentary sanction, this stimulus will be removed by the creation of a new Examining Body. A consideration of the subject in all its bearings induces us to believe that there is no ground for apprehension in this respect. The proposed new College having only one function to perform, namely, that of examining Candidates and granting Certificates, will simply confer the privilege of Registration, with a qualification to carry on the business of a Pharmaceutical Chemist. It will operate chiefly as a protection to *the public* against the mischief arising from ignorant persons dispensing medicines, and at the same time will raise the character of our body generally. The PHARMACEUTICAL SOCIETY, being still, as it always has been, a voluntary Association for the advancement of Pharmacy and the protection of the general interests of *its Members*, will comprise privileges not contemplated in the other body, and membership will be a distinction to which those will aspire who take an interest in science, and are anxious to elevate the social position of their profession. Those who have been educated at the School of Pharmacy will naturally be disposed to continue their connection with the institution to which it belongs, and the Subscription is so moderate, that it need not be an obstacle.

In proportion as the School flourishes, in common with other Chemical Schools, from the increased demand for education, this branch of the Society's operations will become less burdensome to the funds, and will probably more than support itself. When this is the case, a larger sum may be transferred annually to the Benevolent Fund, which, in the course of a few years, is likely to become a very important acquisition.

In order to ensure the complete success of our endeavours to place our body under a system of self-government, it is not sufficient to possess the power of compelling Candidates to come up for Examination. The means of education must exist and be carried out in the most approved and efficient manner. That schools for this purpose will be established by private individuals or companies, is not improbable; but there ought at least to be one leading establishment conducted by Pharmaceutical Chemists, which may be considered the type of the class of institution required for this purpose. Such an establishment will enjoy a rank proportionate with its merits, and will confer on all who are connected with it a character and position which will be a stimulus to continued exertion. The PHARMACEUTICAL SOCIETY originated as an educating body, and adapted its educational arrangements to the particular wants of our students: it fills up the gap which would otherwise have existed, and may be expected to rise in estimation, as the importance of education becomes more obvious on account of the compulsory examination instituted by Act of Parliament.

These preliminary observations will serve to prepare our readers for the consideration of the proposed Act of Parliament, of which we proceed to give a brief outline. The preamble alludes to the necessity of proper education in dispensers of medicine, and the registration of such as are duly qualified. For this purpose it is proposed to found a College of Pharmacy. All Chemists and Druggists in business at the time of the passing of the Act are to be entitled to Registration, and being registered, will become Members of the College. A definite period (twelve months ?) will be allowed for this registration, which is to be conducted by a registrar under a provisional Council of not less than five Chemists and Druggists (appointed by the Secretary of State ?). A small fee (one guinea ?) is to be required from each member on his registration; except in the case of the Members of the PHARMACEUTICAL SOCIETY, who, being already registered as Chemists and Druggists under a Royal Charter, will be exempted. At the expiration of the period allowed for registration, a list is to be published, and a general meeting summoned, at which a Council of twenty-one is to be elected, which Council is to elect a President, Vice-President, Treasurer, and other officers. It is needless on the present occasion to state in detail the regulations for conducting the election, and other technicalities constituting the machinery of the Bill. We need only observe, that it has been the object of the Council to frame these regulations in such a manner as to guard against the abuses occasionally met with in corporate bodies.

It will be the duty of the Council to frame bye-laws, which must be submitted to the Secretary of State, or the law officers of the Crown, before they will be valid.

The Council are also to appoint a Board of Eight Examiners, who are to examine Candidates in Classical knowledge, Botany, Materia Medica, Pharmaceutical and General Chemistry, and Toxicology, and who must make a declaration to the effect that they will perform this duty faithfully, impartially, honestly, &c. The persons so examined and furnished with certificates of qualification will be entitled to registration as Pharmaceutical Chemists and Members of the College; and after the end of one year from the passing of the Act, no person will be entitled to such registration without having previously passed the examination.

The following is the clause which is proposed for prohibiting unqualified persons from assuming the name and exercising the business of a Pharmaceutical Chemist and Druggist :—

"And be it enacted, That any person (except any person established in business as a Chemist, or Chemist and Druggist, at the time of the passing of this Act) not being duly registered under this Act as aforesaid, who shall, after the end of one year from the passing of this Act, engage in or exercise the business or calling of a Chemist, or Chemist and Druggist, or who shall, by himself, or his Assistants or Apprentices, prepare, compound or dispense for sale or gain on his own account, any Medicines or Medicinal substances, by or from any order, receipt, or prescription of any Physician, Surgeon, or other qualified Medical Practitioner, or any other person whatsoever, or who shall take or use the name or title of Pharmaceutical Chemist and Druggist, or Chemist, or Chemist and Druggist, or shall use, display, or exhibit any sign, token, or emblem, implying that he is a person registered under this Act, shall forfeit and pay for every such offence a sum not exceeding Ten Pounds."

And the following clause defines the manner in which this provision is to be enforced:—

"And be it enacted, That it shall be lawful for any two of Her Majesty's Justices of the Peace, in Petty Sessions assembled, acting for the County in which the offence shall have been committed, or for one of the Justices appointed by virtue of an Act passed in the second and third years of Her Majesty Queen VICTORIA, intituled 'An Act for regulating the Police Courts of the Metropolis,' to hear and determine in a summary manner any Complaint charging any person with any offence under this Act, on the oath of one or more credible Witness or Witnesses, or by his own confession, and to award the penalty hereinbefore provided for any such offence."

A clause is introduced exempting from the operation of the Act all legally qualified Medical Practitioners; and another clause exempting Manufacturing Chemists, the vendors of simple and uncompounded drugs, patent or stamped proprietary medicines, and horse or cattle medicines.

It was considered advisable to introduce these exemptions in order to remove the chance of opposition which would inevitably arise, if any interference were attempted with any other class or classes of persons having vested interests at stake, and not being connected with our body. This precaution having been taken, and the Bill having been framed exclusively for the regulation of Chemists and Druggists, and with the view of elevating the character and social position of our branch of the profession, and at the same time benefiting the public, no reasonable ground of opposition could be substantiated; and if our brethren in general come forward earnestly in support of the Bill, we see no reason to anticipate much difficulty in passing it, either in its present form or with such verbal improvements as a further consideration of the subject may suggest.

FIFTH ANNIVERSARY OF THE PHARMACEUTICAL SOCIETY.

Five years have nearly elapsed since the establishment of the Pharmaceutical Society, and the Annual Meeting is summoned for Tuesday the 19th of May, for the election of officers and the reception of the Report of the Council for the past year. We are informed by the Secretary that twenty-three names have been proposed as Members of Council; but so many of the parties have declined to serve, that we anticipate that the number willing to accept office will only be sufficient to fill the fourteen vacancies. Several of the present Council have expressed their determination to decline the office, in order to make room for fresh names, and others have offered to do the same in the event of other Candidates appearing in the field. We mention these circumstances to show that the Council in general are more anxious to share the honour of "office" with their brethren, than their brethren are to participate in the responsibility.

The other business to be transacted at the Annual Meeting is to receive and consider the Report of the Council; and on the present occasion we hope to see a numerous attendance, as some important subjects of discussion may arise, as forming part of the Report and affecting the general interests of the Society.

During five years the Society has been progressing steadily, and laying the foundation of that reform among ourselves which, if brought to completion, will effectually prevent the recurrence of any of those political annoyances and agitations in which our body has in times past been involved. We have commenced the work by introducing a systematic Pharmaceutical education, and creating facilities for the advancement of the Art and Science of Pharmacy, which part of our undertaking has proceeded with even greater success than could have been anticipated, considering the difficulties attending a voluntary association of this nature. We are now in a position to appeal to facts in support of our claims to legislative assistance; and in order to complete the benefit which we are endeavouring to confer on our profession and the public, we only require an Act of Parliament which shall impose a proper test of qualification on all future Pharmaceutical Chemists, and thus extend the advantages of education throughout the whole body. This is the ultimate object which we have had in view from the commencement, and the time has arrived at which we must either take another step in advance, or run the risk of losing the advantages already gained. We cannot now remain stationary. Pharmacy is at this present time in an equivocal position in this country. Its importance as a branch of the profession is generally recognised, and unless we establish ourselves permanently in the position which properly belongs to us as Pharmaceutical Chemists, we shall lose an opportunity which may not occur again.

The Council having decided upon recommending the course which they think it advisable to adopt under existing circumstances, the subject will of necessity be mentioned in the Report, and the Members of the Society will have an opportunity of expressing their opinions respecting its adoption. We have no reason to anticipate any want of unanimity, on the general merits of the question; but it is desirable to ascertain the sentiments of the Members at large, in order that advantage may be taken of any suggestions which may be offered.

It is probable that some of our brethren, in common with many medical reformers, expect from legislation more than is practicable, while others may scarcely be prepared to recognise its full importance. A calm consideration of the facts of the case is likely to reconcile any differences of opinion which may exist on minor points, and to lead to the unanimous adoption of a resolution embracing the grand objects which we all have in view.

MEDICAL REFORM.

Although there is no Bill at this moment before Parliament, we have every reason to believe that the subject will be introduced before many weeks have elapsed. Sir James Graham has stated that he is still disposed to assist in this arduous task in the event of a Medical Bill being presented to him, which shall have received the sanction of the profession generally.

Mr. Wakley has given notice of his intention to prepare a Bill, which he will bring forward during the present month. The general heads of this intended measure have been published in the Pharmaceutical Journal, vol v., number 3, page 101. The National Association of General Practitioners held a meeting at the Hanover Square Rooms, on Friday evening the 17th, at which several resolutions were carried with more unanimity than usual. It appears from the Report recently published*, that the application of that body, in conjunction with the Society of Apothecaries, to the Secretary of State for an incorporation of the General Practitioners, has not been attended with success; but the Association, being thrown on their own resources, are resolved to persevere in their undertaking, and it is now proposed to create a *voluntary* Association of General Practitioners, under the title of "The National Institute of Medicine, Surgery, and Midwifery." The following is the proposed constitution:—

One President, three Vice-Presidents, a Council of forty-eight Members (half residing within ten miles of London and the remainder in the country), and Members (consisting of Licentiates of the Society of Apothecaries, and other qualified Medical Practitioners).

The Institute thus voluntarily constituted, will possess no legal powers, but by amalgamating with the Society of Apothecaries, will endeavour to carry out more effectually the intentions of the Apothecaries Act of 1815.

In the mean time the Society of Apothecaries, in order to check the mischief resulting from the present state of uncertainty in the profession, has published the following advertisement:—

> "The Society of Apothecaries, anticipating the probability of a change in the laws which regulate the practice of Physic and Surgery in this country, were unwilling, while the Medical Bill of the Secretary of State for the Home Department was still before Parliament, to have recourse to proceedings of a penal character for enforcing an observance of the 'Act for better regulating the Practice of Apothecaries throughout England and Wales.' Sir James Graham, however, having intimated that it was not his intention to reintroduce any similar measure at present, and it appearing that numerous individuals are entering upon the practice of Medicine who have given no evidence of their possessing the requisite skill and ability for such practice, to the serious risk of the public health, and to the discouragement of a zealous course of study on the part of Medical Students, the Society of Apothecaries deem it to be their duty to give this public notice, that they will use their utmost endeavours to secure to all classes the full benefit of the provisions of the Apothecaries' Act, and that upon being furnished with the names of individuals alleged to be practising as Apothecaries without having submitted themselves for examination and obtained the certificate of qualification required by law, accompanied by adequate proof of such illegal practice, the Society will forthwith institute the necessary legal proceedings for the punishment of the offenders.—By order of the Master, Wardens, and Court of Assistants, "ROBERT B. UPTON, Clerk to the Society.
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> "*Apothecaries' Hall, April* 7, 1846."

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[*] Three Reports of the joint deputation of the Society of Apothecaries and the National Association of General Practitioners, appointed to confer with the Secretary of State on the subject of the incorporation of the General Practitioners in Medicine, Surgery, and Midwifery. Published by Samuel Highley, 32, Fleet Street.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

ABSTRACT OF A LECTURE
ON THE VALUE OF CHEMICAL TESTS.

BY EDWARD SOLLY, F.R.S. AND F.L.S.,
Professor of Chemistry to the Horticultural Society, etc.
[*Delivered March* 25, 1846.]

Mr. Solly commenced by giving a brief definition of the nature and objects of chemical inquiries, describing Chemistry as being a purely experimental science, but at the same time pointing out the value of theory if properly used, as a guide or assistant in an experimental search after the truth, to be afterwards confirmed or rejected according to the results of experiment; but not to be implicitly and blindly adopted as an established truth, to which the results of experiment must subsequently be made to conform; as in that case facts themselves are distorted, and the judgment being prejudiced, it becomes doubly difficult to discover the truth, when thus viewed as it were through a perverting medium.

The use of theory in chemical inquiries was illustrated in the simplest operations of testing: the Chemist after one or two preliminary experiments, or even after a mere external examination, generally forms a more or less distinct theory or supposition of the nature of the substance he is about to examine; and having for the moment adopted this theory, he proceeds to use those tests which will at once prove or disprove the truth of his supposition; by proceeding in this way he saves time, and arrives at the truth sooner than he could by merely experimenting at random.

Tests may be said to be of two kinds, general and special; the former including the ordinary tests for acid and alkali, the latter those which, like the action of ammonia on salts of copper, indicate at once not merely the general nature of the substance under examination, but also ascertain exactly its precise composition. In testing for any substance, the Chemist does not require to obtain the substance he is seeking for, in its pure and separate state; but merely evidence of its presence as shown by the existence of any of its compounds. Thus, for example, in testing for copper, the blue produced by the action of ammonia, together with the characteristic red-brown precipitate produced by ferrocyanide of potassium, is perfectly satisfactory evidence of the presence of the metal; and again, the existence of carbon in olefiant gas is proved by the formation of carbonic acid gas when it is burnt, which is easily recognised by its weight and action on lime water, &c. In the first case we may obtain the metal itself by precipitating it on clean iron or zinc; and in the latter case, by burning the gas mixed with chlorine, we may exhibit the carbon in a black and solid form; but the chemical evidence is not thus strengthened, or rendered more complete. A test is an indication of the presence of some substance, which proves to us that the elements of which it is composed, must also themselves be present, and is therefore quite as satisfactory as the exhibition of those elements themselves.

The mode in which theory, as based on induction, is used in ordinary chemical testing, was illustrated by an examination of the common green-paper used for wrapping pamphlets, &c.; and which it was shown is dyed with two colours, one blue and the other yellow, the former being destructible by heat, the latter not. It was then proved that the yellow colour, being destroyed by the vapour of muriatic acid, and not by heat, was chromate of lead; and that the blue colour being bleached by potash and not by chlorine, was Prussian blue, the composition of the dye being thus satisfactorily proved by four simple experiments, devised one after another, and each grounded on the result of the preceding one.

Attention was next drawn to the delicacy of chemical tests, by comparing the quantity of a substance which can be estimated by the senses, with that which can be rendered evident by a chemical test. Gold leaf is about $\frac{3}{1000000}$ of an inch in thickness, and a piece of gold leaf $\frac{1}{100}$ of an inch square weighs nearly the $\frac{1}{1000000}$ of a grain; but many chemical tests enable us to detect the $\frac{1}{10000000}$ of a grain, and some of the tests for iron are so delicate that they indicate the $\frac{1}{21000000}$ of a grain of that metal.

In consequence of the indestructibility of matter, many different tests may be applied in succession to the same portion of matter, in those cases where the use of one test does not interfere with that of others; thus, for example, we may show the alkaline nature of lime-water, then precipitate it as carbonate, show the solution and effervescence of this precipitate by sulphuric acid; again precipitate the sulphate by the addition of oxalate of ammonia, and finally by burning convert the oxalate of lime into quick lime again; being thus able, as it were, to ring any number of changes at pleasure, or expose the same portion of the substance under examination to the action of a number of different tests.

Mr. Solly then pointed out the existence of limits to the use of tests, describing some of the circumstances under which they are inapplicable in consequence of the exceedingly minute quantity of matter to be detected. The most important and interesting cases of this kind are in inquiring into the presence of very minute traces of different substances in the air, a subject hitherto but little investigated, and one which is surrounded by many difficulties in consequence of the extreme care required in detecting and estimating the presence of such substances; yet at the same time a study full of interest, and bearing immediately on some of the highest considerations of physiological chemistry, the nature of certain diseases, the relation of contagion and epidemics to organic and inorganic matters, &c. The few researches made by Chemists into the nature of fogs, have hitherto thrown very little light on the subject, because the quantity of the substances present in them is very minute, and the bulk of air which must be experimented with is necessarily so large, as to render such experiments laborious, expensive, and very difficult. Even in less complicated investigations, such as the quantity of ammonia, nitric acid, and sulphuretted hydrogen in the air, the difficulties attending all quantitative experiments are very great. The evident connection existing between the presence of the last-mentioned gas and certain forms of disease, gives to all experiments as to its presence in the air a peculiar interest, and seems to demand accurate and careful study. Mr. Solly mentioned that he had frequently been led to observe the presence of an unusually large quantity of sulphuretted hydrogen in the air of towns, at certain periods of the year, particularly in the early spring, as shown by the rapid and general blackening of white lead paint; and he therefore suggested that experiments on this point would probably lead to valuable results, if a good and convenient test could be devised to measure and estimate the quantity of this substance present in the air from week to week.

In connection with this subject, and as illustrating the manner in which minute quantities of solid matters, too small to be detected by ordinary Chemical tests, might be constantly present in the air, some curious experiments were shown with the fixed alkalies. One of the most delicate tests for distinguishing potash from soda, is that afforded by their action on flame, the former tinging flame pinkish white, the latter bright yellow; and accordingly flame was employed to indicate the presence of fixed alkaline matter in the air. It was shown, that by burning a few grains of charcoal mixed with nitrate of soda, a minute quantity of alkaline matter was carried up in the air, which remained suspended in it for a long time, even for many hours, it was said; and which could be conveyed to a distance in the air, and yet shown to be still present, by its effect upon flame. The quantity of alkali thus detected was certainly less than $\frac{1}{1000000}$ of a grain, and by these means the suspension of lime, and other earthy and metallic substances might also be shown, though in no case had it been seen in a more marked manner than with soda. The influence of volatile substances in detecting the suspension of fixed substances in the air, was also very remarkable, a point which might be exceedingly well illustrated by observing the effect of steam in carrying up soda; the steam issuing from a retort containing boiling water produced no effect upon the test-flame, but when carbonate of soda was added to the water, the steam immediately acquired the property of tinging the flame yellow, showing that soda was carried up together with the aqueous vapour. Another good example of the influence of volatile bodies in causing fixed ones also to mix in vapour, was afforded by muriate of ammonia; this salt when heated in the air sublimes readily as a white cloud or fume, but when a small quantity of phosphoric acid is added to it, the vapour of the sal-ammoniac carries up with it a very minute quantity of phosphoric acid, in consequence of which the vapour acquires the property of condensing in white solid flakes and filaments in the air.

The numerous interfering circumstances which prevent the action of tests were then adverted to—the necessity of guarding against their effects strongly insisted on, more particularly in all cases of testing for poisons, and attention drawn to the necessity of minutely and accurately observing all the appearances presented by the reagents employed; as otherwise the presence of various substances might frequently be overlooked. It must be remembered that tests were of no use if the Chemist was not prepared to observe or interpret correctly the changes which they produced. Amongst the circumstances which frequently interfered with the use of tests, the following were mentioned:—

Many tests require some time before any precipitate is produced, and must therefore be allowed to stand some hours before they are finally examined, and this precaution is of course more essential in testing for minute quantities, than in those cases where much of the substance is present.

The operation of some tests is altogether prevented if the solution is hot, the precipitate being dissolved, and forming a clear, transparent, and colourless solution; thus, for example, a hot solution of a salt of lead gives no precipitate with iodide of potassium; and a hot solution of starch remains white when iodine is added to it, though if cold, in the one case a brilliant yellow precipitate, and in the latter case an intensely deep blue colour, is produced.

In many cases the precipitate formed remains dissolved, because it is soluble in excess of either the liquid or the precipitant, an effect well seen in forming iodide of mercury, which readily dissolves in excess of either the salt of mercury, or the iodide of potassium. Sometimes, also, the precipitate is soluble in water, and requires the addition of spirit to cause its separation. This is the case with the double chloride of platinum and potassium, and with the supertartrate of potash, &c.

The action of tests is also sometimes prevented in a curious manner by the presence of particular forms of organic matter; thus, for example, the precipitation of oxide of iron is frequently prevented by the presence of vegetable acids, starch, gum, &c.

In consequence of these and other interfering causes, it is desirable never to trust to any one test alone, however good it may appear, but always to employ two or more distinct ones. This is more especially the case in all those cases where colour alone is concerned, as changes of colour are often produced from causes quite independent of chemical action; thus, many substances when heated change colour, many solutions appear of different colours when viewed by transmitted and by reflected light, or when examined by day or candle light; and besides, many salts, when dissolved in water, like the chlorides of chromium and copper, form solutions in colour different from the dry salts. Indeed, a number of solutions alter considerably in colour when rendered more dilute. Thus, sulphate of molybdenum changes from blue to white, chloride of copper from green to blue, &c., and a blue dilute solution of chloride of copper, when heated, acquires for the time the rich green colour of a strong solution. Precisely the same change is produced by exposing turmeric paper to the action of ammonia or muriatic acid; but a very different effect is produced by the same two gases on litmus paper, hence the use of the second test obviates the source of error which might possibly be introduced by the first.

In conclusion, Mr. Solly adverted to the importance of from time to time testing the purity of the tests and reagents employed, pointing out some of the numerous errors which may be fallen into, from want of attention to this precaution.

PHARMACEUTICAL MEETING,

WEDNESDAY, APRIL 8, 1846.

MR. MORSON, VICE-PRESIDENT, IN THE CHAIR.

ON EAST INDIAN KINO.

BY J. FORBES ROYLE, M.D., F.R.S.,
Professor of Materia Medica and Therapeutics in King's College, London.

KINO is well known as an astringent substance in small and shining, brittle, angulated fragments of a deep brown colour. It appears to be a natural exudation of some one plant, from the uniformity of its appearance. Several kinds of Kino are however met with in commerce, as well as described in books, as that of *Butea frondosa* from India, at one time acknowledged by the D. C., and which has no doubt been sometimes imported as Kino; Botany Bay Kino produced by *Eucalyptus resinifera*, or Brown Gum tree, at one time acknowledged by the E. C.; a Jamaica and a Columbian Kino are mentioned, and an extract of Rhatany is sometimes ennumerated with them; but genuine Kino has been supposed to come from the West Coast of Africa, while there is no doubt—and the fact may be easily ascertained by any one making enquiries in the proper channels—that the best is now imported into this country from Bombay.

Kino seems to have been first introduced into European practice by Dr. Fothergill in 1757, in a paper in *Med. Obs. and Enq.* I. 358, where he states that he was indebted for information respecting it to Dr. Oldfield, and that the substance was obtained from the river Gambia, whence he called it *Gummi rubrum astringens Gambiense.* Previous to this, Moon, in his travels into Africa, mentions a red-gum as issuing from incisions in trees, and which he mistook for Dragon's-blood. Mungo Park discovered that the tree which yielded this substance was called *Pao de Sangue* (blood-tree) by the Portuguese. His specimens were determined by Mr. R. Brown to belong to *Pterocarpus erinaceus*, a tree which has since been well figured and fully described in the *Flore de Senegambie.*

P. ERINACEUS (*Poiret Illust. t.* 602, *f.* 4.,) *L. E.* A tree 40 or 50 feet in height, with the bark exuding a peculiar blackish coloured juice; leaflets 11-15, alternate, ovate, oblong, obtuse or subemarginate, above smooth, on the under surface, covered with dense short tomentum. Flowers yellow, stamens 8-10, monadelphous or irregularly diadelphous. Legumen orbicular, membraneous, undulate at the margin, and terminated on one side by a sharp point (the base of the style), in the centre covered with stiff bristles. 2-celled or 1-celled, and cell 1-seeded. A native of Senegambia.

The wood of this tree is reddish coloured; when the bark of its trunk or branches is injured, a reddish coloured juice issues, which quickly hardens in the air, becoming of a blackish colour. This brilliant, friable, and astringent substance, though like Kino, does not seem to be collected. "Nous ne l'avons pas vu extraire pour les usages pharmaceutiques sur les bords de la Gambie."—*Fl. de Senegambie*, I. p. 230., t. 54. And no Kino is known to be imported here from the Coast of Africa.

The origin of the name Kino has not yet been satisfactorily ascertained. As stated by Dr. Pereira, it was introduced into the *Edinburgh Pharmacopœia*, 1774, as *Gummi kino*, and into the *London Pharmacopœia*, in 1787, as *Resina kino*. It was described under this designation in the third edition of Lewis's *Materia Medica*, 1784; but in the second edition, 1768, it is described as *Gummi rubrum astringens*, from Gambia. I have long been of opinion that the name was derived from the Indian *kuenee*, or *kini*, applied to a similar exudation from the bark of *Butea frondosa*, of which the Sanscrit name is *Kin-suka*. (*Himal. Bot.* p. 195, and *Proceedings of the Royal Asiatic Society*, p. 50, 24th May, 1838.) The last is the abstract of a paper written on the occasion of some of the gum of the *Butea frondosa* having been sent as *Kino* to the above society from Bombay. That it had also been imported formerly is evident from Dr. Pereira having, several years previous to 1840, found "in the warehouse of an old drug firm in London a substance marked 'gummi rubrum astringens,'" which he was told had formerly fetched a very high price. It proved, on comparison with the above specimens, to be *Butea gum*. This, however, is very distinct from the Kino of commerce, which, for many reasons, I was inclined to think, even when this paper was read, was the produce of *Pterocarpus Marsupium*; but so many substances having been called Kino, it was impossible to prove the fact without authentic specimens, though sufficient proof has since been obtained by two independent courses of investigation.

Dr. Pereira states in the first edition of his *Materia Medica*, that what he calls *East Indian kino* is always regarded in commerce as *genuine gum kino*, and that an experienced East India broker assured him it was the produce of the Malabar coast. Dr. Pereira also traced it to Bombay and to Tellicherry, which is on that coast. It may be added in confirmation, from inspecting the official reports of the commerce of Bombay, that Kino exported to this country from Bombay had been previously imported from the Malabar, coast to the extent in 1835-6, of thirty-six hundred weight. My attention was again especially turned to this subject on finding in the India House specimens of Kino marked from Anjarakandy, which I recognised as being identical with the present Kino of commerce. I was unable for some time to ascertain the locality of Anjarakandy, until informed by Mr. Dyer, the same who had sent specimens of the Wynaad Gamboge tree to Dr. Roxburgh, that it was the name of a farm within a few miles of Tellicherry—that is, near the very place to which Dr. Pereira had traced the East Indian Kino.

Having thus determined the place, the next point was to ascertain the plant which yielded this kind of Kino, as well as its mode of preparation. This was effected by writing to Dr. Wight, the distinguished Indian botanist, who was then, as now, stationed at Coimbatore in charge of the Government Cotton farm. Though he did not at first succeed, Dr. Kennedy afterwards sent him specimens of the flower, leaves, and fruit, also a small portion of the wood and of the gum, on inspecting which Dr. Wight states, "the specimens received along with the letter leave no doubt that the Malabar kino is the production of Pterocarpus Marsupium." Dr. Kennedy writes that he is informed by his friend, Mr. J. Brown, of Anjarakandy,* that

> "The juice is extracted when the tree is in blossom, by making longitudinal incisions in the bark round the trunk of the tree, so as to let the gum ooze down into a receiver formed of a broad leaf so placed and fixed in the bark as to prevent the gum from falling on the ground. From the leaf it is made to run into a receptacle placed under the leaf to receive the gum. When this receptacle is filled, it is removed, the gum is dried in the sun until it crumbles, and then filled into wooden boxes for exportation."

For this result I was prepared, because Dr. Gibson had already stated, as printed in the above proceedings, p. 59, that "Kino was the produce of *Pterocarpus Marsupium* (*beula* or *bia*), a tree very common below the Ghats." The same fact is mentioned on his authority in the Catalogue of Bombay Plants, p. 56, 1839, and also that the Kino is exported in considerable quantities from the Malabar coast. Dr. Roxburgh, however, was no doubt the first to direct attention to this tree, which, he states, exudes a red juice, which hardens into a strong, simply astringent brittle gum resin of a dark red colour, and strongly resembling that of the Butea frondosa; so that the same analysis might serve for both. He further observes, that the specimen of the gum Kino tree in the Banksian Herbarium is exceedingly like this plant. This hardening of the red juice into a brittle dark-coloured substance is characteristic of several of the species: as of *P. erinaceus* on the coast of Africa, and of *P. santalinus*, or red sandalwood, as also in the *P. Draco* of the West India islands, of which the red juice which flows from wounds hardens in a short time.

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* Since then I have discovered that this was formerly one of the East India Company's plantations, under the superintendence of a Mr. Brown. It was visited by Dr. Buchanan in January, 1801 (*Journ. in Mysore*, II. p. 544), at a time when, he states, numerous valuable experiments were carrying on in the plantation.

DESCRIPTION OF THE TREE YIELDING MALABAR KINO.

P. Marsupium, *Roxb.*, is a lofty tree, with the outer coat of the bark brown, the inner red, fibrous and astringent; leaves subbifarious, alternate, leaflets 5-7 alternate, elliptic, emarginate, above shining and of a deep green colour, from 3 to 5 inches long. Panicles terminal; petals white with a tinge of yellow, long clawed, all waved or crested on the margins; stamens ten, united into one body near the base, but soon splitting into two bodies of five each. Ovary generally two-celled, legume long-stalked, the under three-fourths orbicular, the upper side straight; the whole surrounded with a waved veined membraneous wing, rugose and woody in the centre, generally one, sometimes two-celled; seed solitary, kidney-shaped. Roxb. *Corom. Pl.* ii., t. 116, published in 1798. *Fl. Ind.*, iii., p. 234. A native of the Circar mountains and forests of the Malabar coast; also in the Ghats, between Vellore and Bangalore, and again in those near Coimbatore; apparently also in the forests at the foot of the Himalayas, according to Hamilton, as he mentions it under the name of *Vijaya*, as occurring in the lower woods of Nepal, and also at Kodoya and Gunjuriya, to the eastward of Bengal.

Dr. A. T. Thomson, many years since, made a series of comparative experiments with different reagents on African, Botany Bay, Jamaica, and East Indian Kino. It is interesting to observe in how many instances the effects on the first and last correspond with the same reagents. This might be expected, supposing the specimens to have been genuine, and the effects of the reagents prove that they were so, because they are proved to be the produce of two species of Pterocarpus.

Dr. Thomson states that *East Indian Kino*, which he also calls *Amboyna Kino*, and which he supposes is produced by *Nauclea Gambir*, is imported in chests, containing from one to two hundredweight, and that on the inside of the lid of each chest is a paper, inscribed with the name of John Brown, the month and year of its exportation, and stating that it is the produce of Amboyna. This statement made me, when in India, look to the eastward for the Kino of commerce, especially as I knew that there was a Mr. Brown who had the most extensive plantations in the island of Penang.

In conclusion, I would suggest, as the name Kino has been applied to so many different substances, that if continued to be used generically it should be restricted to astringent *natural* exudations, while the astringent extracts might all be arranged, as most of them now are, under the head of Catechu. In recapitulation we may observe, that though the original *Gummi rubrum astringens* may have come from the Gambia, it has long ceased to do so. If we admit that the name *Kino* is derived from the Indian *Kuenee* or *Kini*, its place must have been first supplied by the astringent exudation of *Butea frondosa*, which is well calculated to answer all the same purposes, but is not so clean looking; though a very elegant extract in appearance resembling citrate of iron may be prepared from it, as detailed in the accompanying notice by Mr. E. Solly. For many years, however, this Butea Kino has been itself displaced by Kino imported from Bombay, which has been proved to be the produce of *Pterocarpus Marsupium*, as will be further evident from a perusal of the accompanying documents.

FROM DR. WIGHT TO DR. ROYLE.

"*Coimbatore*, 19*th Nov.*, 1844.

"I did not intend to have troubled you this month, but the arrival this morning of the enclosed note from my friend Dr. Kennedy on the matter of Malabar Kino, has made me change my mind, so far as to inform you that the specimens received along with the latter leave no doubt that the Malabar Kino is the production of *Pterocarpus Marsupium*. Brown's name being mentioned as the informant of the mode of extracting it adds vastly to its value."

FROM DR. KENNEDY TO DR. WIGHT.

"*Cannanore, Nov.* 15*th*, 1844.

"It is a long time since you spoke to me on the Neelgherries about the tree that yields the gum Kino on this coast. I had not, however, forgot your request to me to make inquires about the tree, and to send you specimens for inspection, but until now I have never fallen in with the tree in blossom. I have much pleasure in acquainting you that I have this day dispatched, per Bangy, to your address, a small box containing specimens of the flowers, leaves, and fruit, also a small portion of the wood and of the gum. I trust they may arrive safe, and in such a state as to enable you to make a satisfactory examination; lest the specimens should spoil before they reach you I have *ventured* to send you a short description of the tree, but for the accuracy of which I will not vouch, as it is many a day ago since I have relinquished my botanical studies. I shall be glad to know that the box arrives safe, and in the event of your requiring more specimens, I will be happy to send them."

DESCRIPTION OF THE KINO TREE OF MALABAR.

Diadelphia Decandria.—LINN.

"A lofty broad-spreading forest tree, leaflets generally five, sometimes six, alternately pinnated, ovate or oval, a small notch at the top, glabrous, upper surface concave and shining; spikes branched; petals four in number, forming a papilionaceous corolla (viz. the vexillum alæ and carina); calyx greenish and slightly tubular, five-toothed; stamens ten, forming a sheath at the base, but divided at the upper part; legume on a stalk varying from one-and-a-half to three inches in length; one-seeded, and surrounded by an irregular roundish membranous wing, having a small pointed delicate spur on the margin; flowers yellow with reddish veins. The tree blossoms in October and November; the bark of the tree is of a grayish colour, and is upwards of half an inch in thickness on the trunk. When cut a blood-red juice speedily exudes and trickles down, it soon thickens and becomes hard in the course of fifteen or sixteen hours. The wood of the tree is white, and except at the pith is free from any colour. The trunk of the tree from which I took the specimen sent measured ten-and-a-half feet in circumference—another tree of the kind in the same locality, (the cantonment of Cannanore) measured nine feet. I am inclined to believe it is one of the Pterocarpæ. The following account of the mode in which the gum is extracted was given me by my friend Mr. J. Brown, of Anjarakandy :—'The gum is extracted in the season when the tree is in blossom by making longitudinal incisions in the bark round the trunk of the tree, so as to let the gum ooze down into a receiver formed of a broad leaf so placed and fixed in the bark as to prevent the gum from falling on the ground ; from the leaf it is made to run into a receptacle placed under the leaf to receive the gum. When the receptacle is filled, it is removed ; the gum is dried in the sun until it crumbles, and then filled in wooden boxes for exportation.'

'*Cannanore, November 14th*, 1844." "J. Kennedy.

ABSTRACT OF A PAPER ON THE KINO OF BUTEA FRONDOSA.

BY J. F. ROYLE, M.D., V.P.R.S.

Read before the Committee of Commerce and Agriculture of the Royal Asiatic Society, 24th May, 1838, Proc., p. 50.

Dr. Royle then read a paper on the astringent exudation of the *Butea frondosa*, premising that any substance of this nature likely to be valuable as an article of commerce, should not only possess valuable properties, but be abundant in nature, therefore cheap, and at the same time not very bulky. The *Dhak* or *Pulas* (*Butea frondosa*) was one of the most common plants, either as a tree or shrub, throughout almost every part of India. Its timber was good, but being usually small, only used for fuel ; the ligneous fibres of its roots were employed for rope-making ; its flowers yielded a dye; and from its bark exuded a powerfully astringent gum, while the lac insect frequently settled upon its branches ; so that the same labourers might be employed in collecting these various products. Dr. Roxburgh has fully described the red juice which exudes from fissures and incisions in both *Butea frondosa* and *B. superba*, which afterwards hardens into a ruby-coloured, brittle, and very astringent gum ; but adds, that he was unable to find that the natives made any use of the gum or flowers. Dr. Royle, however, stated that it was well known to, and employed by the Indians in N.W. India as a medicine, and was there called *Kumr-kus*, *Dhak-ka-gond*, and also *Kueni-ka-gond* : and he added, that from the combination of the astringent with the gummy principle, it was particularly eligible in many cases for which astringent medicines were prescribed. It thus probably came to be called emphatically *Kumr-kus*, or binder of the loins. It had been brought to England, and submitted to him for examination, by Mr. Beckett, who had long resided at Allygurh, in the Northern Doab. Mr. B. hoped that it might prove of sufficient value to become an article of commerce, as it was employed by the natives of N. Western India, for precipitating their indigo. By Col. Galloway it was further stated, that it was likewise employed by them in tanning. The author then proceeded to adduce proofs of this not being a substance which was entirely unknown in Europe ; as on comparing it with a reddish-coloured astringent gum which he had obtained from his friend Mr. Pereira, it appeared to be identical with it in appearance and properties. This Mr. P. had found in one of the old druggist's warehouses of this city, labelled as *Gummi rubrum astringens*, which it is remarkable was one of the names by which *kino* was originally known. Some of this having been sent to M. Guibourt, it was described by him as one of the kinds of kino, by the name *Gomme astringente de Gambie*, and which he states as having entirely disappeared from commerce, when it was rediscovered by Mr. Pereira, as above mentioned. It is curious, that among the specimens from Bombay, there is some of this same astringent gum of the *Butea frondosa* which is sent as Kino. This is more filled with impurities, is in smaller pieces, and of darker colour than that brought by Mr. Beckett; but it is still more closely like the specimen found labelled as *Gummi rubrum astringens*. The original Kino having been introduced into practice by Dr. Fothergill, and called "Gummi astringens Gambiense," was ascertained by Park to be the produce of a *Pterocarpus*, which was named by Mr. Brown, *P. erinaceus*. But as no specimens are to be found of Dr. F.'s original Kino, we are unable to ascertain how much it resembled that of the *Butea frondosa*. It is curious that Dr. Roxburgh describes an exudation from *Pterocarpus Marsupium*, in the peninsula of India, as so closely resembling that from the *Butea*, that one description and one analysis, he says, may answer for both. It is very probable, therefore, that the *Butea-Kino* very closely resembled the original *Kino*, the origin of which name M Guibourt states he has found it impossible to trace; but it is probably not accidental that the name of the *Butea-Kino* is *Kuenee* in N. India, and that its Sanscrit is *Kis-suka*. There can be no doubt, however, that the *Butea-Kino* was one of the original substitutes for the African *Kino*, and was sold at a high price. Had there been a museum of useful Indian products, it probably would never have disappeared from commerce, but would at this day have been extensively imported, instead of being itself supplanted by substitutes from the Eastern Islands, New Holland, South America, and Jamaica. Mr. E. Solly's analysis will probably have the effect of again restoring it to commerce.

Mr. E. Solly described the above exudation of the *Butea frondosa*, as being a transparent brittle substance, of a brilliant ruby-red colour, having a very strong astringent taste, and agreeing with the *Kino* of the shops in most particulars, but differing sufficiently to be easily distinguished from it. He detailed a series of experiments undertaken with a view to the separation of its beautiful red-colouring matter, and its application in dyeing. The result of these showed that the colour was increased and darkened by exposure to the air; but that whether it was precipitated when in its freshest state, or when the Kino had been exposed to the air for some time, the colours obtained were dingy and undecided, being mostly of a pinkish-grey colour. From the careless mode in which the Kino had been collected, it contained from 15 to 25 per cent. of impurities, consisting of wood, bark, small pebbles, and sand. A portion in the crude state, as received from Mr. Beckett, contained about 50 per cent. of tannin, but when purified by simple solution in water, so as to separate the impurities, one hundred parts contained 73.26 parts of tannin, 5.05 of difficultly-soluble extractive, and 21.67 of gum, with gallic acid and other soluble substances. The author stated, that the exact proportion of tannin contained in any specimen of this substance would vary much, according to the mode of collection and time of year at which it was obtained; and recommended its being collected from the trees as soon as it had become hard, and not after it had been exposed to the air, light, and moisture, for some time. Under the latter circumstances, the properties as was long ago ascertained by Dr. Roxburgh, become somewhat altered, and its value considerably diminished. The probable importance of this substance in tanning leather, was adverted to; and the author concluded by stating, that experiments on its applicability to that art were in progress, and would be detailed on a future occasion.

A paper was also read, by Dr. Royle on the tree yielding African Olibanum, the publication of which is unavoidably postponed until next month.

ON THE BEST MEANS OF DISGUISING THE TASTE OF NAUSEOUS MEDICINES.

BY WILLIAM ACTON, ESQ.
Surgeon to the Islington Dispensary, and formerly Externe to the Venereal Hospital of Paris.

As I am in the daily habit of prescribing those peculiarly nauseous substances copaiba and cubebs, my attention has been constantly directed to render these medicines as palatable as possible, without in the least interfering with their efficacy; and in doing so I have tried most of the plans recommended by different practitioners. In the belief that my experience might interest the Society, I have been requested to write a short paper embodying my views on the subject, as they are applicable to a large number of nauseous or bulky substances; and with this view I venture to call the attention of the meeting first to a few of the old-fashioned methods of prescribing these remedies.

An amusing collection of loochs, electuaries, and mixtures might be made from the old dispensatories. Fashionable physicians of the last century appear to have thought of only one way of disguising the taste or odour of nauseous medicines, by prescribing largely aromatic water, essential oils, honey or syrups. Need I say this plan has now been given up, or only followed by the remains of the gold-headed cane school, who still seem to adhere to the motto,

> "Omne tulit punctum, qui miscuit utile dulci ?"

The Young England school of Pharmacy began their improvements by introducing certain *culinary innovations*, among others stands prominently forward the

'COPAIBA CUSTARD,

which, we are told, should be made in the following manner:—

℞ Vitelli Ovi No. j.
Bals. Copaib. ʒiv.
Aq. Flor. Aurant. ℥iij.
Syr. Tolu. ℥ss.
Aquæ Distil. ℥ij.
Ess. Limon. gtt. iij.

It is to be regretted that this Esculapian Ude has not furnished posterity with his name, were he alive, however, I fear his former patients would recommend him to confine his practice to the servants' hall, as his *entremets* are not adapted to the present fashionable style of cookery.

Other *Pharmaceutical artistes* have turned their attention to concentrate the powers of nauseous medicines in extracts and essential oils, thinking thereby to do away with bulk and flavour, but they soon found that when they destroy the flavour, they are obliged to increase the quantity. In illustration I beg to give the prescription of a physician, brought to me a few weeks ago by a patient who had been under his care for four months.

℞ Ext. Copaibæ Resinos. ʒij.
Ext. Cubebæ ʒj.
Ol. Essent. Cubebæ ʒij.
Pulv. Glycyrrhizæ gr. xij.
Mucilag. q. suf. M. ft. mass. et in pil. xxxvj. divid.
Sumat. iv. ter die.

Twelve pills a day!! Why, surely a statue should be raised to the martyr who thus supports the pill trade! Staticians would tell you that this individual took 84 a week, 336 a month, or 1344 during the four months, and, as the poor fellow told me with a sigh, all to no purpose. When he related his tale, I was disposed to ask him, as Mr. Adolphus, the barrister, did a witness (who came forward on a trial to speak of the efficacy of large numbers of Morison's pills), how he managed to swallow them: was it by the aid of a shovel, or a coal-scuttle? for without such aid he (Mr. Adolphus) was unable to conceive it possible to bolt these "monster" doses; but, perhaps, this is the new plan of giving physic to the "million," and not adapted for private practice.

But to be serious, these means are now seldom resorted to, and modern Surgeons in private practice find it only necessary to resort to some expedients for bulky or nauseous solids, and one of two others for liquids. The best plan of giving solids is by means of

WAFER-PAPER.

This paper, according to Dr. Ure, is made in the following manner: "A certain quantity of fine flour is to be diffused through pure water, and so mixed as to leave no clotty particles. The pap is not allowed to ferment, but must be employed immediately it is mixed. For this purpose a tool is employed, consisting of two plates of iron, which come together like pincers, or a pair of tongs, leaving a small definite space betwixt them. These plates are first slightly heated, greased with butter, filled with the pap, closed, and then exposed to the heat of a charcoal fire. The iron plates being allowed to cool, on opening them the thin cake appears dry, solid, brittle, and about as thick as a playing-card." We meet with it in small sheets, of a light colour, breaking easily when dry, but tenacious and moulding itself easily to the substance it covers when wet, increasing but slightly its bulk. When any powder is to be taken, it must be mixed with syrup or other tenacious substance to the consistence of a bolus, and the patient be desired to break off as much of the paper as may be necessary to envelope the substance, dip it (the paper) in water, lay it on a plate or clean surface, and then place the electuary in its centre, fold the corners carefully over it, and swallow it by drinking a little water. Some persons have suggested putting the powder on the paper, and folding it without wetting the powder. This I should not, however, recommend, or an exposure of the mixture might result, much to the disgust of the patient and to the injury of the method. Those who are unable to swallow pills can manage to bolt these boluses covered with wafer-paper; they slip down the throat easily, as would an oyster, and do not produce that convulsive action of the muscles of the larynx and pharynx which frequently attend the effort of swallowing pills. I would strongly recommend the use of the wafer-paper as an envelope for scammony, when prescribed for children, a medicine so frequently producing nausea. It is equally applicable for taking the pulv. jalap comp., or any other substance prescribed in ʒ or ʒss. doses.

The Chemist must take care not to make the electuary too soft, or the object would not be attained.

The best modern method of giving nauseous liquids is in the form of

CAPSULES.

Of these I find no end of varieties; but I fear the majority of the makers of such useful articles have not a very clear idea of the objects sought to be attained. Need I say, that it is of the greatest importance to employ genuine copaiba? The next important point is to obtain a capsule of a certain definite size, so that we may know what dose the patient is taking, and which the Surgeon is generally unable to do. Another circumstance to which the manufacturer gives but little attention, is the thickness of the capsule. I would recommend the Chemist to reject all samples that are not an eighth of an inch thick. In many instances I have known the capsule burst in the effort of swallowing, or dissolve as soon as it is in the stomach. I have called the attention of the profession to the subject, in my work on venereal diseases, and must refer those curious on the subject to page 61. An improvement has lately been introduced by enclosing copaiba in membranes, thus obviating many of the objections to all gelatine capsules. I am told that these membraneous capsules are in the hands of respectable parties, who make a point of filling them with genuine copaiba. I would suggest, however, to the patentees to increase the size, and make them uniform, or the Surgeon will return to the gelatine capsules, which, when properly manufactured, answer the purpose.

The Chemist should, in the selection of his capsules, take particular care that no one of them leaks, or the odour of the oil will be rapidly communicated to the others, and our object in giving copaiba in this way frustrated. The patient should be told likewise to take his capsules after meals. By this means the gelatine will not immediately be acted on by the gastric juice, and those unpleasant adjuncts to copaiba, eructations, will not be experienced. Many persons will tell you they are unable to take pills, and feel convinced they will be unable to swallow capsules; recommend such sceptics to take about a dessert spoonful of water in their mouth, and then place the capsule on the tongue, when the whole will be swallowed without difficulty, whereas if the capsule be placed on the tongue and water be drunk, the patient will often swallow the water, but the capsule will remain and produce convulsive action of the pharynx. Given in this way, it is singular how soon the medicine will act and effect the purpose we have in view; and it is no less remarkable that the stomach becomes tolerant of the medicine—a patient has not that tell-tale face so often characteristic of one taking nauseous medicines. I shall not venture to describe the gilding of pills, or the introduction of fluids into the back part of the throat by means of glass tubes, but may refer to an excellent plan of covering pills and bolusses with gelatine, as mentioned in a former number of the PHARMACEUTICAL JOURNAL. In this last way, however, the pills or boluses are not able to mould themselves to the form of the throat, and the plan is far inferior to the wafer-paper, which I hope to see more usually introduced than at present, when bulky or nauseous medicines are to be given.

Queen Anne Street, Cavendish Square.

THE CHAIRMAN drew the attention of the Society to the necessity of procuring genuine copaiba. He regretted the sale of the cheap capsules to be found in the shops at a price that it was impossible to suppose could remunerate the parties provided they were properly manufactured. He also called the attention of the Society to the capsules containing castor oil, and proved how impossible it was to form a concentrated oil; doubtless, the contents of these capsules contained small portions of croton oil. This form of giving purgative medicines, he thought, far from objectionable, only the trade should know what they were dispensing. He considered the capsules of animal membrane worthy the attention of the Medical profession; and that their value ought to be determined by a trial. The thinness of the material was certainly an advantage, as a larger quantity of the medicine could be given in a capsule of the same bulk.

A MEMBER spoke of the superiority of the French over the English wafer-paper, both in colour and consistency, and believed, if a sufficient demand existed, that the article could be sold at a very moderate price. At present it was principally obtained at the confectioners, as it was largely used by them in their business. He thought it a very desirable means of disguising medicines, and believed its use was not sufficiently known.

ON SOLUTION OF MAGNESIA.

BY MR. JOSEPH LEAY.

THE solution of bicarbonate of magnesia is a preparation which has been sanctioned and prescribed by medical men for several years past, and may now be considered an established article of our Materia Medica. The strength and purity of such a solution is so easily ascertained, that I am really surprised that any one should be bold enough to bring before the public, under the above name, a preparation that will not stand the test of examination; yet it will be found that much of the solution of magnesia of commerce is not only very deficient in strength, but that in some cases it contains other salts besides the carbonate of magnesia in solution.

Many persons who have attempted the manufacture of this solution, have fallen into the error of using the common carbonate of magnesia of commerce, which, having been dried, is much less easily dissolved, through the agency of carbonic acid, than the recently precipitated but undried carbonate would be. This no doubt is one cause of the very deficient strength of much of the solution sold.

There are, however, some makers in this and other towns through the country, who adopt a very easy, expeditious, and economical method of making what they call *solution of magnesia.* This consists in simply dissolving sulphate of magnesia and bicarbonate of soda, or bicarbonate of potash, in water. I need hardly say, that after separating the carbonate of magnesia from this by boiling it, sulphate of soda will remain in solution. It is said that some medical men approve of the preparation made in this simple manner, and do not object to the presence of the purgative salt which it contains. Be this as it may, it is surely desirable that there should be some other name applied to this solution, so as to distinguish it from the simple solution of bicarbonate of magnesia. The latter solution requires an expensive apparatus for its proper preparation, while the former may and ought to be made by every dispensing Chemist for himself.

The subject is one which I think ought to be brought under the notice of the Pharmaceutical Society, as the best means of making the Chemists and Druggists and the Medical profession aware of the great discrepancy there is in the composition of the preparations sold under the name of "Solution of Magnesia."

187, Broad Street, Birmingham.

A MEMBER present alluded to the deposition which takes place in the bottles containing the solution of magnesia, even that sold by the original makers, and thought this must materially affect the strength of the solution, as he sometimes found large crystals in the bottles.

Mr. **Redwood** said he could confirm the statement of Mr. Leay with regard to the difference in the strength and composition of different specimens of solution of magnesia, and it was very important that Medical Men and Dispensing Chemists should be aware of this want of uniformity, as the preparation was frequently ordered in prescriptions. Mr. Dinneford and Sir James Murray were justly entitled to the credit of having introduced this very elegant and useful remedy to the notice of the public. They were the first makers, and, he believed, they continued to be among the best makers of it. No secret had ever been made of the composition of the solutions sold by these makers. Mr. Dinneford's solution was stated, on the authority of Professor Brande, Dr. Paris, Dr. Wilkinson, and Dr. O'Shaughnessey, to contain from seventeen to nineteen grains of carbonate of magnesia in every fluid ounce; and Sir James Murray's solution was stated, on equally good authority, to contain about thirteen grains in the fluid ounce. Now it was upon these preparations, being those first introduced to notice, that the reputation of the remedy had been founded. Mr. Dinneford's was probably as strong a solution as could be made, and might be fairly taken as a type of what the preparation ought to be. But Mr. Dinneford made no more secret of the method of making his solution than he did of the composition of it, and the manufacture was therefore open to free competition. There were, as Mr. Leay had stated, several manufacturers in different parts of the country, and he (Mr. R.) had examined the solutions produced by some of these makers, and found them to be very different from those of the original makers. Thus, for instance, in one case he found only as much magnesia present as was equivalent to about four grains of the hydrated carbonate of magnesia of commerce in the f℥j., while the solution contained at the same time sulphate of soda and a small quantity of sulphate of potash, from which it was evident that it had been made by dissolving sulphate of magnesia with bicarbonate of soda and bicarbonate of potash, in water. These ingredients, in the proportion of fourteen grains of crystallized sulphate of magnesia, seven grains of bicarbonate of soda, and two-and-a-half grains of crystallized bicarbonate of potash, to one ounce of distilled water, formed a solution identical with that to which he had alluded. Now, it was very evident that this formed a solution which could not be substituted for that originally introduced under the name of "Solution of Magnesia." Then, with regard to the statement of the last speaker, that the solution made by the original makers was liable to a deposition of magnesia on the inside of the bottles, he thought it much more important that the solution should be of uniform strength than that it should be in the most highly concentrated state when first prepared. He would advise the manufacturers of it not to attempt to make it of greater strength than that at which it could be kept unaltered for a reasonable length of time. Under all the circumstances which had been stated, it was obviously necessary that every Dispensing Chemist, before using any specimen of solution of magnesia in a prescription, should first ascertain the strength and composition of the solution. He recommended the following simple method of examining it: Evaporate a fluid ounce of the solution to dryness in a Wedgwood dish; calcine the residue at a red heat for about five or ten minutes, in a small Berlin crucible; then weigh the calcined residue. If this residue be pure calcined magnesia, every five grains of it will be equivalent to twelve grains of the hydrated carbonate of magnesia, or *Magnesia alba* of commerce. After weighing the calcined residue, treat it with distilled water, when, if there be any soluble salts present, they will be dissolved out, and may be tested, weighed, and the amount deducted from the weight of the magnesia.

LIST OF MEMBERS,
ASSOCIATES, AND APPRENTICES—(CONTINUED).

Elected in March and April.

MEMBERS.

BATH	Burlton, James, Milsom Street
BERWICK . . .	Davidson, John, Marygate
BRADFORD . . .	Walbran, Thomas F., Westgate
BRIGHTON . . .	Chaplin, Alfred, Church Street
BRISTOL	*Davies, Elijah Knox, 1, Brunswick Place, Clifton
BURY ST. EDMUNDS	Portway, John, Abbeygate Street
CHELMSFORD . .	Asling, Brelsford, High Street
COLCHESTER . .	Buck, William, 28, High Street
DEPTFORD . . .	Martin, James, High Street
FOLKESTONE . .	Hammon, Richard, Dover Street
GLASGOW . . .	Campbell, Donald, 136, Argyle Street
HAVANT	White, George, West Street
HEXHAM . . .	Pruddah, William, Fore Street
HOUGHTON-LE-SPRING . . .	Burne, Robert Thomas, Sunderland Street
IPSWICH	*Marchant, Charles Fred., Butter Market
LEAMINGTON . .	Pratt, Edmund
LEWISHAM . . .	Flint, John D. S., Lee Bridge

LONDON	Allen, Arthur, 22, Holles Street
	*Butler, Samuel, 4, Cheapside
	Crossley, John, 41, Bishopsgate Street
	Earland, John, 172, Bond Street
	*Harding, John Thomas, 4, Cheapside
	Lane, Edward, Brompton Row
	Lea, John, 22, Brunswick Place
MIDSOMER NORTON	Dudden, Richard Mogg
MILTON	Sutton, George, High Street
PENRITH . . .	Kirkbride, William, Great Dockray
PLYMOUTH . . .	Finemore, William Foot, 13, Union Street
PONTYPRIDD . .	Bassett, Charles, Taff Street
PRESTON	Kellett, Edwin, 2, Fylde Road
RICHMOND . . .	Clarke, Thomas Meadows, George Street
RYDE, I. W. . .	Wheeler, James Edward, High Street
SHREWSBURY . .	Sharrod, Joseph, Castle Street
SOMERTON . . .	Goodridge, William, Broad Street
WICKHAM MARKET	Yates, Thomas, Middle Street
YORK	Allen, John V., 18, Walmgate

MAJOR EXAMINATION.

Whitney, jun. George .	Shrewsbury

MINOR EXAMINATION.

Corrin, William.	2, Haymarket
Cooper, Daniel	Hackney
Summers, John L. . . .	19, Bath Place, City Road

REGISTERED APPRENTICES.

APPRENTICES.	RESIDING WITH	TOWN.
Cole, Frederick . .	Mr. Higgins . .	Birkenhead
Dymond, Geo. . . .	(late Croydon) .	Bristol
Edwards, Henry J. .	Mr. Purdue . .	Bexley Heath
Fisher, Henry C. . .	Mr. Morton . .	Ramsgate
Fryer, John	Mr. Collier . .	York
Groves, Thomas B. .	Mr. Groves . ,	Weymouth
Jones, Frederick . .	Mr. Colk . . .	London
Johnstone, William .	Mr. Wilkinson .	London
Millidge, Thomas . .	Mr. Millidge . .	Newport, I. W.
Parkinson, Robert . .		Croydon
Russell, Charles J. L. .	Mr. Knowles . .	Maidstone
Smith, Corbett . . .	Lea & Perrins ,	Worcester
Vidler, Thomas Collins	Mr. Plomley . ,	Rye
Wakefield, Cecil H. .	Lea & Perrins .	Worcester
West, James . . .	Mr. Binge . .	Westminster
Willoughby, Charles H.	Mr. Phillips . .	Luton

ORIGINAL AND EXTRACTED ARTICLES.

ON GUTTA PERCHA,

A VARIETY OF CAOUTCHOUC.

BY E. SOLLY, F.R.S., F.L.S.*

A VERY remarkable substance, bearing the name of *Gutta percha*, and in many respects closely resembling caoutchouc, or India-rubber, though in others evidently distinct, has during the last year been transmitted to this country from Singapore, and brought before the notice of practical men. It was first sent over by Dr. Montgomerie, who received the gold medal of the Society of Arts for its introduction into this country, as a new and hitherto unknown substance likely to be useful for various purposes in the arts. He was, however, it appears, unable to ascertain its history further than that it could be obtained in very large quantities, and at a moderate price, being used by the natives as a substitute for horn and wood for a variety of purposes, more especially to make the handles of knives and choppers, as from its peculiar nature, though easily softened by the application of heat, it remains firm and hard at ordinary temperatures, allows a very firm hold to the hand, is very lasting, and not subject to decay of any sort—hence it is even said to be preferred for these purposes to buffalo-horn. The tree which yields it, and the mode in which it is prepared, are unknown; it is, however, stated that it is procured by cutting down the trees, a most wasteful and unnecessary proceeding. It it probable that the sap or juice of the tree is rubbed over a smooth surface, and on drying leaves a coating of the substance of greater or less thickness, and that these films are subsequently joined or rolled together into solid masses. The first specimens brought to this country—both that sent to the Society of Arts, and also samples which I received at the same time from Dr. Royle, from the East India House—were in two forms, namely, thin scraps resembling in appearance clippings of white leather, and solid rolls, which, when cut across, exhibit the end section of the thin layer, by the junction of which the mass has been formed. These masses are far from being pure, a considerable quantity of sawdust and other vegetable and mineral impurities being entangled between the layers.

As gutta percha is beginning to excite a good deal of interest, and appears likely to become an article of considerable importance in a commercial point of view, I have thought that a brief notice of its chemical nature and peculiarities would not be without interest to the chemical section of the British Association. I do not think it at all necessary to refer to the very curious history of India-rubber, or the numerous and still increasing applications in the arts of which it forms the subject. They are so well known to every one, that it is evident that a new variety of this most useful substance, if possessed of distinct characters, cannot fail to be soon made available in the hands of the manufacturer, either as an advantageous substitute for some older material, or as leading to some new application in the arts, either useful or ornamental.

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* Read June 23d, 1845, at the Cambridge meeting of the British Association.—Gutta percha was first brought before the Society of Arts in the autumn of 1843. It is mentioned in the *Gardener's Chronicle*, Dec. 9, 1843.

Gutta percha is a white or dirty-pinkish-coloured opaque solid, having little or no smell, insoluble in water, and consequently tasteless. Its pink colour is probably in part derived from the presence of impurities, because when purified in hot water, in a manner I shall immediately describe, the water acquires a pinkish hue, whilst the gutta percha becomes white or gray. It has a silky fibrous texture, which becomes more evident when a piece of it is slightly extended; it feels smooth and almost greasy between the fingers, at the same time that it presents considerable resistance to any substance which is rubbed or drawn across it, thus enabling it to be grasped or held with great firmness in the hand.

At temperatures below 50° it is hard, very tough, and in thin pieces slightly flexible, a good deal resembling horn in its physical characters; at from fifty to seventy it becomes more flexible and slightly elastic, still, however, retaining its remarkable stiffness and toughness. When forcibly extended it shows very little power of contraction, requiring considerable force to extend it, and retaining the form it has assumed after the force which was applied is discontinued.

At a temperature between 140° and 160° it becomes soft and remarkably plastic, its tenacity at the same being greatly diminished. In this state two or more pieces may be joined together with the greatest facility, far greater than is the case with caoutchouc, and in a manner, indeed, which may almost be compared with bee's-wax, inasmuch as it matters little whether the pieces to be joined are clean or dirty, they readily unite with the slightest pressure and form a perfect joint. Hence it is easily purified by "devilling" or kneading in hot water, the impurities are quickly and completely got rid of, and a solid mass of the pure substance is obtained; even if torn up into small fragments, the slightest pressure causes them to unite perfectly again. By merely boiling a piece of the rough solid substance in water, cut into moderate-sized fragments, the greater part of the foreign matters present may be removed, and the gutta percha is afterwards obtained in a solid mass. When thus softened either by the action of hot water or by simple exposure to heat, it may be readily moulded into any required shape, or pressed into a mould or pattern ; as it cools, it gradually reacquires its former tough and rigid nature.

In consequence of this property it is easy to form very perfect casts of coins, medals, &c., which if carefully made from the pure substance are nearly white, and have all the sharpness of sulphur, without any of its brittleness. At ordinary temperature they are, if not very thick, flexible and moderately elastic, but if their form is much distorted, they take up a permanent alteration, or *set*.

When hot, as has been just said, it has very little tenacity, and it is then, of course, readily divided with a knife. In its hard cold state, it opposes great resistance to the knife or saw, behaving exactly like cold hard caoutchouc, and cutting only with the greatest difficulty. Its division is, however, very much facilitated by the use of a wet tool, in the same manner as is the case with caoutchouc. Even with this assistance, however, it is nearly as hard to cut as fir wood.

In its crude state it is considerably lighter than water, floating readily on that fluid. When carefully deprived of the air which it contains, it is still lighter than water, but considerably denser than ordinaryc aoutchouc, its specific gravity being 0.9791, whilst that of ordinary caoutchouc is about 0.9355.

When gutta percha is kept for some time at a temperature of about 150°, it gradually parts with a small quantity of water, and loses its white aspect, becoming dark-greyish brown and translucent. It however soon reacquires its usual appearance if kept in warm or even cold water for a short time.

In its chemical relations, it closely resembles ordinary caoutchouc, with which, indeed, it is identical in composition. It differs slightly from that substance in its behaviour to certain liquids; but the chief points of difference are chiefly of a physical nature. Exposed to destructive distillation, it is almost entirely resolved into a mixture of several volatile and gaseous hydrocarbons, which possess nearly the same remarkable odour, and are probably identical in composition with the volatile oils of caoutchouc: a small portion only of carbonaceous residue is left. Heated in the open air on platinum foil, it melts, froths up, and burns with a bright and very smoky flame, emitting at the same time the very peculiar odour evolved during its destructive distillation, and when a piece of it, after being half burnt, is extinguished, the residue is found to be permanently altered, being converted into a viscid sticky fluid.

Ordinary solvents exert little or no action on gutta percha.

Water, alcohol, alkaline solutions, muriatic and acetic acids produce no effect. Strong sulphuric acid gradually charrs it, and nitric acid slowly oxidizes it, forming a quantity of a yellow resinous matter. Ether, essential oils, and coal-tar naphtha slowly soften it in the cold, and when heated form imperfect solutions. The most perfect solvent appears to be oil of turpentine, which dissolves it with great facility, forming a clear colourless solution, from which the pure gutta percha may be obtained by the application of heat. As the oil of turpentine distils off, the gutta percha is left nearly colourless and transparent.

The physical properties of this substance are such as to place it amongst the substitutes for leather. Indeed, it resembles leather as much in properties as it does in appearance, whilst it is free from those peculiarities which prevent the employment of caoutchouc for the more ordinary uses of leather. I have little doubt that in a short time we shall see gutta percha almost as important an article of commerce as caoutchouc is. Only during the last day, and since writing these brief notes, I have seen some walking-sticks which appear to be made of this substance, and of which a quantity has just arrived in Liverpool from Singapore. I am unable from mere inspection to ascertain whether they consist of gutta percha alone, or a mixture of that substance with some other material. When carried in the hand, they emit an odour closely resembling that of ordinary caoutchouc; but still, from their toughness, I should conclude that they are merely gutta percha.

ADDITIONAL NOTE BY THE AUTHOR.

SHORTLY after the meeting of the British Association at Cambridge, in June, 1845, when the preceding short paper was read, Dr. Royle kindly pointed out to me two notices on gutta percha which had appeared in the *Journal of the Agricultural and Horticultural Society of India*, by Dr. Monat, ii. p. 101, and by the Rev. Edward White, iv., p. 59. Dr. Monat's account of the chemical properties of gutta percha, and which is dated July, 1843, agrees very closely in most points with the description of it which I have given; the letters from Dr. Montgomerie accompanying his paper, and dated March 1st, 1843, state that gutta percha, or gutta tuban, as it is called by the Malays, is the produce of a large forest tree indigenous to Singapore and the neighbouring countries. The specimens sent over by Dr. Montgomerie were obtained from a forest about six miles from the town of Singapore. From Mr. White's paper, which contains a description of the plant, it appears that it is a tree related to the Sapotaceæ and Ebinaceæ; having a straight and lofty trunk, about three feet diameter at the base, with numerous ascending branches. The timber is represented as hard, and used for building prows, &c. The leaves are alternate, petiolate, oblong, with a small point at the apex, base tapering, length four to five inches, breadth two inches; surface, upper bright green, feather nerved; under brownish red, from dense pubescence; mid-rib and petiole the same. Flowers axillary, sessile, four together; small and white calyx persistent, sepals six, brownish red, in a double series, those outer largest. Œstivation valvate. Corolla monopetalous, six-cleft, lobes one-fourth and tubes one-eighth inch long, deciduous. Œstivation tarsted. Stamens twelve in a single series, equal, similar, inserted in the mouth of the tube. Filaments equal in length to the lobes of the corolla. Anthers saggitate, extrorse, and affixed by their base to the filaments. Pollen scanty. Ovary superior, conical, sessile, seated on a disk, six-celled, each cell containing a single ovule suspended from a central axis; funiculus conspicuous.

ARTIFICIAL ULTRAMARINE:

ITS COMPOSITION AND CHEMICAL PROPERTIES.

ULTRAMARINE, whether native or artificial, always consists of silica, alumina, sulphur, and a little oxide of iron; but no two specimens contain these substances in the same proportions. Native ultramarine is procured from the lapis lazuli,—the artificial kind, according to Robiqnet's process, is made by heating to low redness, a mixture of one part of porcelain clay, one and a half of sulphur, and one and a half parts of anhydrous carbonate of soda, in a covered crucible so long as vapours are given off. When opened, the crucible is usually filled with a spongy mass of a deep blue colour, containing more or less ultramarine, mixed with the excess of sulphur employed, and some unaltered clay and soda. The results are, however, by no means uniform. The price of the native ultramarine was formerly five guineas an ounce, the artificial is sold at a few shillings an ounce, and is equally durable.

The colour of both is destroyed by nitric acid, or by a long-continued full red heat. Hence the difficulty in preparing the artificial variety. The destruction of the colour by nitric acid renders it easy to detect the admixture of cobalt, or Prussian blue, with ultramarine. The presence of indigo would be found by the use of sulphuric acid, which destroys the ultramarine and dissolves the indigo unchanged in colour. Strange as it may appear, even the artificial ultramarine is now largely adulterated. A specimen, lately examined by M. Chevalier, was found to contain forty per cent. of blue carbonate of copper. This is decidedly injurious, because the blue colour of copper, under exposure to air and light, slowly becomes green.

The discovery of artificial ultramarine was accidentally made by Vauquelin, in 1814. It was found on pulling down a soda factory, where sulphate of soda had been fused with charcoal, that some parts of the walls had a rich blue colour. This intelligent Chemist examined the substance, and ascertained that it was identical in composition with ultramarine. Prizes were offered in France for a chemical process for its preparation; and the result was that methods were discovered about the same time by M. Guimet, Paris, and M. Gmelin, of Tubingen. The process of Robiquet above given, is an improvement upon those first devised, and all that is now wanted is to discover the conditions for *constant* success. Here is a field for the "young chemistry" of England, if it can be induced to withdraw itself for a short time from the discovery of organic bases!

The essential constituent of ultramarine appears to be sulphuret of sodium; yet on what does the splendid colour depend?—the arrangement of matter! As in the case of the brilliant scarlet biniodide of mercury, which is formed of a white liquid metal and an iron gray crystalline solid, it is impossible to explain the cause of the colours by reference to the existence of any colouring principle. For a long time ultramarine was supposed, like the lapis lazuli, to owe its colour to the presence of iron. Clement and Desormes, however, prepared it without a trace of iron, and, what no one up to that time had suspected, they proved that it contained twenty-two per cent. of soda.

Ultramarine, whether native or artificial, is a most durable colour, and has great solidity; it undergoes no change from the lapse of time, probably from its being already in the state of sulphuret. It is equally blue by daylight and in the yellow light of a candle; while in artificial light cobalt is violet, and other blues appear more or less green, unless admixed with lake or crimson to counteract the effect of the yellow rays. Ultramarine does not appear to have been known to the ancients, although the Egyptians, unaided by chemical science, had discovered a most durable blue, now as bright on their mummy cases, as when first laid down three thousand years ago! Upon the composition of this and the other colours used by the ancients we shall probably make some remarks on a future occasion.—*Medical Gazette.*

ON A NEW AND SIMPLE METHOD OF PREPARING CHLORIC ACID.

BY PROFESSOR BOTTGER.

Every Chemist is aware of the difficulties connected with the preparation of even minute quantities of chloric acid by means of hydrofluosilicic acid. I have therefore endeavoured to discover a more simple and quicker process, which on the whole is, it is true, somewhat more expensive, but in every other respect is certainly preferable to all the other methods hitherto known. The question turned on the employment of some other commercial acid instead of the hydrofluosilicic acid, which would yield, when combined with soda, a salt insoluble or sparingly soluble in water. It certainly appears most advisable, in decomposing a chlorate for the purpose of obtaining the acid, to use in future the readily soluble soda salt instead of the sparingly soluble potash salt. From experience, I was led to believe that oxalic acid would be best adapted, the binoxalate of soda being a very sparingly soluble salt. The following is the process:—A solution of chlorate of soda is first prepared by decomposing bitartrate of soda with chlorate of potash in the following manner:—7 parts by weight of crystallized carbonate of soda and 7½ parts by weight of tartaric acid are dissolved in 24 parts boiling water, and to this boiling solution is added one of 6 parts by weight of chlorate of potash in 16 parts water, likewise heated to 212° Fahr., at the same time agitating the mixture. As soon as this is done it is taken from the fire and allowed to cool, in order that the bitartrate of potash formed may be separated properly; upon which it is poured on a double paper filter, and to the filtered liquid is added a saturated solution of oxalic acid, consisting of 6 parts by weight of oxalic acid, and 18 parts of water heated to not above 134°; the whole is then well agitated, and the vessel placed in an ordinary refrigerating mixture, formed of commercial muriatic acid and sulphate of magnesia, for the better separation of the oxalate of soda, which is then entirely and easily removed by a simple filtration. The chloric acid thus obtained is, it is true, not absolutely pure, but still sufficiently so for most chemical and technical purposes; for instance, for the preparation of the chlorate of barytes, which is so much consumed in the manufacture of fireworks. To obtain a chemically pure and at the same time more concentrated acid, the solution above obtained should be treated with recently precipitated carbonate of barytes, avoiding any rise of temperature; but the solution of the barytic salt may now be evaporated over the fire, and the large beautiful crystals which soon form, are pulverized, dissolved in a little water, and decomposed with a corresponding quantity of sulphuric acid.—*Liebig's Annalen, Jan.* 1846.

PREPARATION OF CARMINE.

The following processes for the preparation of *carmine*, are taken from the 8th volume of *Dumas' Traité de Chimie, appliquée aux Arts*, which is just published.

Carmine, prepared with white of egg.—The carmines known under this name are made in the following manner:—

℞ Cochineal, ℔j. ℥iv.
Carbonate of soda, gr. cxv.
Soft or river water, Cong. iv.

Boil these together for twenty minutes in a vessel, the depth of which is double its diameter, and which is furnished with two handles and a lip to facilitate the pouring out of the liquid. This boiler should also be furnished with an outer rim, which serves to support it over the furnace, so that the bottom alone is exposed to the fire. It should be heated with a wood fire, as the combustion of coal is found to be injurious to the quality of the carmine.

After boiling for twenty minutes, the boiler is to be removed from the fire, and ʒvj of alum, and ʒj of cream of tartar added. The mixture is to be stirred for a few minutes; the pan is then to be inclined so that the liquor may be easily decanted, and then left to itself. By degrees the refuse of the cochineal is deposited—the solution, which was of a violet colour, assumes a rose tint, then a bright red. The liquor is at this time slightly turbid, and evidently contains the carmine in suspension, but in such a fine state of division that it cannot be separated by filtration.

After standing at rest for about a quarter of an hour, the liquor is decanted, and passed through a very fine silk sieve. It is received into another pan, left at rest for a few minutes, and then decanted again, when a slight brownish deposit is left.

The white of two eggs, well beaten up, is then added, and the liquor well stirred. Sometimes the carmine separates immediately in a flocculent form, and of a beautiful scarlet colour. Sometimes the separation does not immediately take place; in this case the pan must be placed on the fire, and left there until the flocculent carmine floats on the surface, which always occurs before the commencement of ebullition. The pan is then taken off the fire, and the floating carmine made to deposit by submerging it with a brush; it is then allowed to stand for ten minutes, and carefully decanted. The liquor becomes transparent, and the deposited carmine is afterwards separated, washed with three or four pints of water and collected on a strainer.

It is dried in a stove at a temperature from 82°. to 86° Fahr. If dried in the open air it would become mouldy.

The carmine thus prepared, will be in the proportion of five or six drachms to the pound of cochineal used; but two or three drachms more, almost as good as the former, may be obtained, by boiling the decanted liquor, and treating it with white of egg as before.

This carmine is well suited for the use of confectioners, perfumers, artificial-flower-makers, and manufacturers of red ink; but it cannot be used by artists, as it is too granular, and does not work well under the brush.

Carmine, prepared with Isinglass.—The following is the process for preparing this kind of carmine:—

℞ Cochineal, in powder, ℔j.
Subcarbonate of potash, ℥iijss.
Alum, in powder, ʒviij.
Isinglass, ℥iijss.

Boil the cochineal and carbonate of potash, in a boiler containing five pails of water. After boiling for a few minutes, take the boiler off the fire and place it on a table, inclined to one side so as to facilitate decantation. Add the alum in powder, and stir the solution. The liquor changes colour and assumes a more brilliant tint. After a quarter of an hour, the cochineal will have deposited, and the liquor have become as clear as if it had been filtered. It contains the carmine in suspension. The liquor is then decanted into a similar pan, and placed on the fire, adding the isinglass dissolved in a considerable quantity of water and strained. At the moment of ebullition the carmine rises to the surface, and a coagulum forms as in clarification with white of egg. The pan is then removed from the fire, and the liquor stirred with a spatula. After a quarter of an hour the carmine will be deposited, when the liquor is to be decanted and the deposit drained on a strained filter, and dried in the manner already described.

THE ALKALOID SALTS, AND THEIR RELATIVE INFLUENCE ON THE ANIMAL FRAME.

BY MESSRS. T. AND H. SMITH, EDINBURGH.

It has often occurred to us, that a great deal of error exists among medical men, and that their ideas are exceedingly vague, regarding the effects on the action of medicines produced by peculiar states of combination, but more especially in the case of the more active vegetable alkalis. For instance: when a salt of morphia is used, one person prefers a muriate, another a sulphate, and a third thinks that an acetate can alone secure the desired effects of the drug, unaccompanied by the idiosyncratic or disagreeable after-effects so apt to occur in some constitutions.

We think that the most proper way to arrive at a clear understanding of the real influence caused by the acid in a powerful vegetable salt—say an acetate, or sulphate of morphia—is to take into account the equivalents of its proximate constituents. Let us, for example, take the muriate of morphia. The equivalent of morphia itself, like most of the active alkaloids, is very high, being close upon 300. The equivalent of muriatic acid is only thirty-seven, being about a tenth of the equivalent of muriate of morphia; and as the medium dose of this last is only about the eighth of a grain, a single dose can only contain about the eightieth of a grain of muriatic acid. As the equivalent of acetic acid is fifty-one, and that of sulphuric acid forty, the argument applies with equal force to sulphates and acetates. Now is it not unreasonable, and as much an outrage upon common sense as the wild doctrines of homœopathy, to suppose for one moment that it can be of the least possible consequence to the patient whether the salt given be an acetate, a muriate, or a salt of any acid whatever? It may be said, that by the combination a peculiar change is produced, analogous to what occurs when a strong mineral acid is neutralized by an alkali, where the characters of both constituents are destroyed, and a new substance, possessing entirely new properties, produced. We do not think this is the case, in so far as medicinal action is concerned. We do not know a single fact sufficiently strong to give the least countenance to such an opinion. The only result, we conceive, that can take place, by combining the alkaloid with an acid, is to obviate any impediment to its complete and quick action on the nervous or absorbing surface with which it is brought into contact. It is certain, that in the case of acetate of morphia, where, perhaps, this preference has been more shown, and the propriety of which has been less called in question than in any other instance, there must be some fallacy in the circumstances supposed to prove its superiority over the muriate; for there can hardly fail to be as much muriatic acid in the stomach, in the greater number of cases, as would be sufficient to decompose the acetate—a consequence resulting from its acid being so far behind the muriatic in strength of affinity; so that, although the acetate be the salt taken, the action on the system is that of a muriate, and not of an acetate.

In fixing our choice on the salt deserving of preference, the reasons on which we should found our judgment should be of a description somewhat like the following:—Which is the most readily and easily prepared? which is most readily got in a state of purity, and sufficiently soluble? and which is least liable to change or decomposition? Taking these characters for guides, in the case of the morphia salts, the muriate ought decidedly to get the preference. In the case of the quinine salts, the sulphate should be preferred, for on account of its sparing solubility on crystallizing, the greater part of the impurities are left behind in the abundant mother liquid.

It has also occurred to us, that it might be advantageous to medical men to suggest, that in administering externally some of the alkaloids, such as aconitina and veratria, in the form of ointment, the activity of the remedy would be more effectually secured by dissolving them in a few drops of a weak acid, such as the acetic, before mixing them with the ointment. In this way their absorption is more effectually secured, and disappointment in the result less likely to happen. In the case of aconitina, we have in this way proved on our own persons its increased activity; and if we mistake not, there is a fact of a similar nature in Dr. Fleming's lately published essay on Aconitum.—*Lancet.*

Duke Street, Edinburgh, March, 1846.

REVIEWS.

THE VEGETABLE KINGDOM; *or, the Structure, Classification, and Uses of Plants, illustrated upon the Natural System.* By JOHN LINDLEY, PH. D., F.R.S., L.S., &c. &c. *With upwards of* 500 *Illustrations.* London: 1846. 8vo, pp. 908.

THIS is the third edition of Dr. Lindley's well-known valuable work on the Natural System. The first edition, which appeared in 1830, was entitled *An Introduction to the Natural System of Botany.* In it the author adopted a slight modification of De Candolle's classification—the apetalous and polypetalous plants being thrown together. The second edition appeared in 1836; and was entitled *A Natural System of Botany.* The author here adopted an arrangement which he had proposed three years previously. He also attempted to reform the nomenclature of the natural system, by giving the terminations—*aceæ* to orders, *eæ* to sub-orders, *ales* to alliances, and *osæ* to groups. In the third and present edition he has extended the number of the primary classes of plants to seven, as the following plan of his arrangement shows:

CLASSES.

Asexual or Flowerless Plants.

Stems and leaves undistinguishable	I. THALLOGENS.
Stems and leaves distinguishable	II. ACROGENS.

Sexual or Flowering Plants.

Fructification springing from a thallus	III. RHIZOGENS.
Fructification springing from a stem; woody stem, youngest in the centre; cotyledon single; leaves parallel-veined, permanent; wood of the stem always confused	IV. ENDOGENS.
Leaves net-veined, deciduous; woody, the stem when perennial arranged in a circle, with a central pith	V. DICTYOGENS.
Wood of stem youngest at the circumference, always concentric; cotyledons two or more; seeds quite naked	VI. GYMNOGENS.
Seeds included in seed-vessels	VII. EXOGENS.

We are strongly inclined to believe that most systematic botanists will hesitate in admitting some of these primary classes. This remark is especially applicable to Dr. Lindley's Rhizogens, which our distinguished countrymen, Dr. Robert Brown and the late Mr. Griffith, have recently endeavoured to show cannot constitute a peculiar class of the vegetable kingdom. And with regard to the class of Gymnogens, we do not perceive the propriety of its separation from Exogens; for no plants are more truly and distinctly exogenous in the structure of their stems than the gymnospermous coniferæ.

From a computation made at the end of the work it appears that about 82,606 vegetable species are known. This estimate includes not only described species but such undescribed ones as are contained in the author's own herbarium "assisted occasionally by a little guess-work, where natural orders have not been recently examined with care, or where species have been notoriously founded upon trifling and unimportant characters." We subjoin Dr. Lindley's estimate of the number of genera and species contained in each of his seven classes.

	Genera.	Species.
CLASS I. Thallogens	939	8,394
" II. Acrogens	310	4,086
" III. Rhizogens	21	53
" IV. Endogens	1,420	13,684
" V. Dictyogens	17	268
" VI. Gymnogens	37	210
" VII. Exogens	18,062	55,911
Total	20,806	82,606

From this, therefore, it appears that, on an average, each genus includes not quite four species.

It cannot, however, be doubted that Dr. Lindley has underrated the actual number of existing vegetable species; indeed, he himself admits that he has no doubt that the numbers are in all cases too low; but he thinks that they are as near an approach to truth as, under existing circumstances, is possible.

We regret that the present work contains no notices of extinct species, genera, and orders; and we venture to suggest to Dr. Lindley the propriety of publishing a systematic work, giving the same kind of information respecting fossil plants, which he has here so ably given about existing species. Such a work, which is much wanted, would very properly form an Appendix to the present volume.

We cannot, we conceive, more briefly place before our readers the plan of the present work than in the author's own words:—

> "Its object is to give a concise view of the state of systematic Botany at the present day—to show the relation, or supposed relation, of one group of plants to another, to explain their geographical distribution, and to point out the various uses to which the species are applied in different countries. The names of all known genera, with their synonyms, are given under each natural order, the numbers of the genera and species are in every case computed from what seems to be the best authority, and complete indices of the multitudes of names embodied in the work are added, so as to enable a Botanist to know immediately under what natural order a given genus is stationed, or what the uses are to which any species has been applied. Finally, the work is copiously illustrated by wood and glyphographic cuts, and for the convenience of students, an artificial analysis of the system is placed at the end."

Such is the plan of the work. Of its execution it is almost unnecessary here to speak, since the two former editions have stamped this as the first book of its kind in this or any other country.

The present edition contains an immense mass of information, both original and compiled; and, like all Dr. Lindley's works, is quite up to the present state of botanical knowledge. The student, therefore, may rely on obtaining in it, the latest and best information on the different topics treated of.

Most of our readers are probably aware that Dr. Lindley's classification of plants differs from that of De Candolle and other systematic writers. Dr. Lindley is a shrewd and able critic, who quickly perceives and points out the defects of other arrangements; to provide a remedy, free from objection, is a very difficult matter: and however great may be the improvement, the adoption of new nomenclature under any circumstances is a choice of evils, as the multiplication of names increases the labour of the student who must make himself acquainted with all the systems in order to understand the standard works of different authorities on the subject. As however, our space does not permit us to enter into any critical analysis of our author's classification; and as, moreover, this journal is not fitted for a discussion on matters so purely botanical, we gladly quit this part of the subject. We cannot, however, do so without adverting to Dr. Lindley's allusions to, and endeavours to meet, the charge of inconsistency, which may be brought against him in not adhering to his former plan of classification after having promulgated it. "Consistency," says Dr. Lindley, "is but another name for obstinacy. All things are undergoing incessant change—every science is in a state of progression."

Our author expresses a very praiseworthy anxiety to improve botanical nomenclature, and to render less repulsive the names employed in botany. To effect these objects he has coined a number of English words as representatives of the Latin terms usually employed by botanists. In some cases his attempts are eminent successful, and we have no doubt several of his new names will gradually come into general use. Of these *Cryptogams*, *Phænogams*, *Fringe-myrtles*, and *Orchids*, may be quoted as examples. But in a large number of cases his new English names are more repulsive than their Latin originals. Take the following as instances: *Apostasiads*, *Pontederads*, *Lardizabalads* (*!*), *Kadsurads*, *Sauvageads*, *Vochyads*, *Pittosporads*, *Xanthoxyls*, *Salvadorads*, and *Chailletiads*.

The nature of Dr. Lindley's work is such that it scarcely admits of illustrative extracts being made from it. We have, however, marked a few subjects, which, perhaps, may interest some of our readers.

Influence of Fungi on the Manufacture of Bread.—"Certain fungi, in an imperfect state, are said by Caignard-Latour, Schwann, and others, to be connected with the process of fermentation. The curious circumstance, that in certain bakehouses all the bread becomes ropy, and though sometimes prevented from assuming this condition by repeated washing of the walls and floor with chloride of lime, the evil is occasionally so obstinate as to prove the ruin of the establishment, is probably dependent on the same cause."

Matico.—At p. 518, Dr. Lindley states that the plant called matico is supposed to be the *Artanthe elongata* (Piper angustifolium). The Peruvians, however, apply the name *matico* to the Eupatorium glutinosum, a very different plant. A specimen of the latter has been presented by Dr. Lindley to the museum of the PHARMACEUTICAL SOCIETY.

The Sack Tree.—"From a species of Antiaris (called by Mr. Nimmo Lepurandra saccidora) sacks are made in Western India by the following singular process:—A branch is cut corresponding to the length and diameter of the sack wanted. It is soaked a little, and then beaten with clubs till the fibre separates from the wood. This done, the sack formed of the bark is turned inside out, and pulled down till the wood is sawed off, with the exception of a small piece left to form the bottom of the sack. These sacks are in general use."

The Antjar Poison.—At p. 270, the author says that, "the venom of the Antjar poison, Antiaris toxicaria, is due to the presence of that most deadly substance strychnia." This, however is a mistake. Strychnia has not been detected in the poison of the Antiaris toxicaria, but in another kind of Upas poison, viz., that which is the produce of Strychnos Tieutê, noticed by the author at p. 603.

Poisonous Spits and Skewers made of the Oleander Tree.—"In 1809, when the French troops were lying before Madrid, some of the soldiers went a marauding, every one bringing back such provisions as could be found. One soldier formed the unfortunate idea of cutting the branches of the oleander for spits and skewers for the meat when roasting. This tree, it may be observed, is very common in Spain, where it attains considerable dimensions. The wood having been stripped of its bark, and brought in contact with the meat, was productive of the most direful consequences, for of twelve soldiers who ate of the roast seven died, and the other five were dangerously ill."

Palm Wood and Coquilla Nuts.—In speaking of the palms, Dr. Lindley has omitted to notice two products of this family employed in this country. One of these is the fruit of *Attalea funifera*, called by Gærtner *Cocos lapidea*, imported from the Brazils under the name of *Coquilla nuts*, and used for turning small ornaments and trinkets employed by ladies. The other is the *Corypha cerifera*, the stems of which have been for some months past on sale at Mr. Haynes's timber-yard, Long Lane, Smithfield, under the name of *Palm Wood*. The latter species is interesting in a pharmaceutical point of view; since it yields the *Brazilian* or *Carnauba Wax*, which is occasionally found in commerce, and an account of which was published by Mr. Brande in the *Philosophical Transactions* for 1811. Specimens of the wood and wax are contained in the Museum of the Pharmaceutical Society.

With these extracts we close our notice of Dr. Lindley's work. In doing so it is scarcely necessary to record our formal opinion of its great merits, and to assure our readers that it contains a vast quantity of matter interesting and useful to many classes of persons, and to none more so than to Pharmaceutists, to whom we strongly and cordially recommend it.

TRAITÉ DE CHIMIE, APPLIQUÉE AUX ARTS. By M. DUMAS. Vol. viii. Paris, 1846.

THIS is the concluding volume of this invaluable work, which has been eighteen years in course of publication. The same comprehensiveness of design, copiousness of detail, and originality of matter, which have so eminently characterized the preceding volumes, are maintained with unabated energy to the last. A large part—more than half—of the present volume of 760 octavo pages, is devoted to the Chemistry of dyeing materials, and the art of dyeing. We have extracted an article from this part, on the Preparation of Carmine, which will be found at page 516. The remainder of the volume treats of vegetable physiology and animal chemistry,—the blood, the urine and urinary calculi, the bile and biliary concretions, the digestive juices and phenomena, the milk, bone, muscle, &c. Copious references are given to the different published papers on the various subjects treated of, and elaborate practical details are furnished, with reference to most of the processes which have been obtained from original sources of information, and it is this which renders the work so valuable to the manufacturer. It will be a lasting monument, alike honourable to its author, and to the department of science of which he is so distinguished an ornament.

AN INTRODUCTION TO QUALITATIVE ANALYSIS. By GEORGE FOWNES, F.R.S. pp. 44.

CHEMICAL TABLES, *chiefly for the use of Junior Students.* By GEORGE FOWNES, F.R.S. pp. 16. JOHN CHURCHILL, Princes Street.

OUTLINES OF THE COURSE OF QUALITATIVE ANALYSIS FOLLOWED IN THE GIESSEN LABORATORY. By HENRY WILL, Ph.D., *with a Preface*, by BARON LIEBIG. TAYLOR AND WALTON, Upper Gower Street, London. pp. 124.

THE simultaneous appearance of these works may be considered as a sign of the times, at least as regards the cultivation of Chemistry in this country. We had, already, much more copious and explicit treatises on chemical analysis, by Parnell and Fresenius, but the little volumes now before us have a different object from those; they are not intended for facilitating self-instruction in analysis, but for meeting the requirements of the several schools which have recently sprung up for affording *practical instruction, under competent teachers*, in the laboratory. The pupils are supposed to have acquired an elementary knowledge of Chemistry before entering the laboratory, and to have previously known, or they learn from their teachers, how to conduct the various manipulations involved in the performance of chemical analysis; all these details, therefore, are omitted as unnecessary. Liebig states, in his Preface to the "Giessen Outlines of Analysis,"—

> "The present work is designed for use in the laboratory; consequently, everything which does not immediately refer to the processes of analysis is very properly excluded. If we consider, as we ought, the main design of practical instruction in a chemical laboratory, to be the exercise of reflection and judgment in order to a profound understanding of the scientific basis upon which the separation of bodies from each other depends, it is obvious that a work adapted for laboratory use must differ from one designed for self-instruction."

The principal feature in these little treatises is simplicity; they are intended as text-books for the pupils to follow, in going through an elementary course of instruction in chemical analysis, and for this purpose they are well adapted.

THE CHEMISTRY OF POISONS; *A concise Arrangement of the most deadly Mineral, Metallic, and Vegetable Preparations; exhibiting at one View the appropriate Tests, in Quantitative Analysis, with their accurately coloured Indications.* By JOHN HORSLEY.

A knowledge of the proper antidotes for poisons forms a part of the qualification which ought to be possessed by every Chemist and Druggist as well as Medical Practitioner—the duty of administering such remedies appertains alike to both. In cases of poisoning, where the opportunity for giving an antidote occurs, it is generally necessary to apply for it to the nearest Apothecary or Chemist; there is no time to seek for an experienced Toxicologist, for a few minutes delay may render that assistance unavailing which otherwise would have saved the life of the sufferer. It often happens too, that it is necessary to ascertain from experiment, what poison has been taken, before it can be determined what the antidote should be.

The amount of knowledge absolutely necessary for the performance of these duties, is by no means so extensive as that which the medical jurist would require, when called upon to give evidence in a court of law. The contents of the stomach evacuated by vomiting, or the dregs of the cup from which the poison has been taken, usually present tolerably easy means of determining, as far as is required, the point in question.

But cases of poisoning are, happily, not of such frequent occurrence as either to make every Medical Practitioner and Chemist an *experienced* Toxicologist, or to keep them by practice in constant remembrance of the tests by which to determine the presence of poisons, and the antidotes by which to counteract their effects. Hence the advantage of *Charts*, to which immediate reference may be made, with the view of refreshing the memory in a case of emergency, on any doubtful point.

It must not, however, be supposed that the "*Chemistry of Poisons*" can be learned by studying the chart before us, or any other of a similar kind. The only legitimate use of such a chart, is that to which we have already alluded, and we question whether for this purpose, the peculiar feature which distinguishes this from others having a similar object is any recommendation to it,—we allude to the attempt to represent by coloured drawings, the characters of the reactions produced by different tests. These, if done by the most skilful artist would be but approximations to nature; as it is they are, many of them, too wide of the mark to lead to any other result than error. The operator must make himself acquainted with the characters of the reactions from practical experience, there is no other way of acquiring this knowledge.

ANIMAL CHEMISTRY, *with Reference to the Physiology and Pathology of Man.* By Dr. J. F. SIMON, of Berlin. Translated for the Sydenham Society, and Edited by Dr. DAY. London: 1845-6.

THE two volumes before us contain no less than 900 pages upon the "Chemistry of Man." The first portion is of an introductory character. It comprises the proximate constituents of the animal body, mineral and organic, each admitting of several sub-divisions. The former necessarily occupy a very brief space, the latter are handled in more detail. The organic constituents are arranged in two principal groups, the one embracing the nitrogenous, the other the non-nitrogenous matters. In the nitrogenous group we have protein (a substance of rather equivocal existence) and its various modifications, gelatin, bilin, and the products of its metamorphosis, hæmatin, urea, uric acid, &c. In the non-nitrogenous, are animal sugars, fats, lactic and acetic acids, &c.

Under the head of Uric Acid, and in a foot-note by the Editor to page 54, we read, "It dissolves in all alkaline fluids, in solution of phosphate of soda, and of borax, but not in solutions of the bicarbonates of potash or of ammonia." Not so, for we find by experiment that uric acid does dissolve in a dilute solution of bicarbonate of potash, containing four grains of the salt to an ounce of distilled water.

The author has furnished a very elaborate disquisition on the blood, extending over 250 pages, and this we reckon the most valuable portion of the work. He discusses its general physiological and chemical relations—the development of the blood corpuscles—the phenomena of circulation and respiration—the metamorphosis of the blood and animal heat, to which is annexed the special chemistry of the blood, with its analysis in health and disease.

At page 171, we find a very minute description of the plan pursued by the author in analyzing blood, and which will require much familiarity with chemical manipulation.

Diseased blood is considered under four forms, viz. *hyperinosis,* where the blood contains more fibrin than in the normal state, and the corpuscles decrease in proportion in the excess of fibrin, the fat being also increased; *hypinosis,* the inverse of this; *spanæmia,* where the amount of fibrin and of corpuscles is diminished; and *heterochymeusis,* where a substance is present that does not exist in healthy blood, as, for instance, urea, sugar, fat, or pus. A multitude of analyses are adduced in corroboration of the above forms.

The other circulating fluids, namely, the lymph and chyle, are next studied in reference to their chemical constitution.

The second volume includes the secretions, excretions, component parts of the animal body, together with morbid concretions, effusions, and deposits. Among these, the most prominent subject is that of urine, to which no less than 240 pages are devoted. These are replete with numerous analyses of that fluid in various diseased conditions. At page 286, it is stated, that Marchand analysed the urine of a child with osteomalacia, and found the earthy phosphates five or six times as abundant as in health. Now, had the editor taken notice of a note at page 337 of the work he has quoted, he would have seen that the child laboured under rickets rather than osteomalacia.

Three copper-plate engravings are appended to illustrate the microscopic appearances of blood, urea, pus, chyle, uric acid, phosphates, cystin, cholesterine, &c. These are well executed.

Dr. Simon's work, although very elaborate, is, we think, in some respects inferior to a treatise on the same subject by Professor Marchand, entitled "*A Manual of Physiological Chemistry*," which is a book about half the size, and containing nearly as much useful information. It was published in 1844, the year after the decease of Dr. Simon.

PENALTIES UNDER THE STAMP ACT.

We have heard of proceedings being recently instituted against several Chemists for selling preparations of Sarsaparilla without a stamp. This annoyance is easily avoided by attention to the terms of the Act. The medicinal properties and uses of sarsaparilla are so generally known, that it is not necessary to enumerate them on every bottle of fluid extract; and the decoction of sarsaparilla being ordered in the Pharmacopœia, and not a secret preparation, is not liable to a stamp when sold on its own merits, either concentrated or otherwise; but if, by way of puff, an eloquent panegyric be appended, with a recommendation of a particular preparation, purporting to be different from that of the Pharmacopœia, and sold with printed directions for use, then the law requires a stamp to be affixed. The object of the law is to impose a tax on quackery. When medicines are sold in a regular way, without disguise or mystery, no stamp is required; but those who derive an extra profit by tickling the credulity of the public with a secret charm, can afford to pay the tax and are liable.

Messrs. Evans and Lescher, the patentees of the membrane capsules, have been threatened with prosecutions for not affixing a stamp; but it appears that this was a mistake, and on a proper representation being made, the proceedings have been abandoned. In this case no secret or mystery is affected. The patent consists in the application of a common substance (animal membrane) to the formation of capsules, in which are enclosed ordinary remedies in daily use. Consequently, the law requires no stamp.

TO CORRESPONDENTS.

Adulteration of Scammony.—G. W. T. (A. P. S.) mentions a peculiar adulteration which he has met with in a sample of scammony, sold as the best at 30*s.* per lb., but which he suspected to be impure from its light colour when powdered. On testing for starch and chalk, neither of these substances was found to be present to any appreciable extent: but a decoction of the scammony became very turbid on the addition of alcohol. By digesting a portion of it with sulphuric ether a quantity of resin was obtained, equal to 32 per cent. The residuum (67 grains) when cold water was added to it, swelled and formed a gelatinous mass; 26 grains were dissolved, and the remaining 41 grains resembled gum tragacanth in its Chemical characters. Our Correspondent suspects, with some appearance of reason, that tragacanth, which is a produce of the same locality, has been used as a substitute for chalk and starch, which latter substances are now so easily detected as to be hazardous adulterations.

Mr. Belling (of Bournemouth) alludes to the contamination of currie-powder when packed in lead. He observed in some packages, that the powder was covered with a white incrustation which, on examination, he discovered to consist of carbonate of lead. From the quantity which he obtained, he calculates that a ½ lb. case of currie-powder contained about 200 grains of carbonate of lead. It had been packed for a considerable time, but the powder was in good preservation, although caked, apparently from having been damp, in which state it was likely to act on the lead.

Carrara Water.—J. P. considers that the question at issue between Messrs. Schweppe and the patentee of the Carrara Water is a Chemical and not a legal one; in proof of which he gives us an analysis of each kind of water, showing entire dissimilarity in the composition. As our Correspondent has not authenticated his statement with his name, we have not published his letter, an analysis being of no value except on some authority. J. P. is quite mistaken in supposing that we intended to disparage the Carrara Water.

Mr. Mason inquires why the stramonium cigars are sold at the rate of about 40*s.* per lb., while the herb itself is 10*d.*? [The herb, as generally sold, is a mixture of the leaf and stalks, chiefly the latter. In making the cigars only a small portion of the leaf is available, the stalks being inapplicable. We have been informed since last month, that Mr. Savory introduced the stramonium cigars two or three years ago.]

"**Francisco.**"—Unguentum hydrargyri nitratis, when diluted, always changes colour, and we believe there is no means of preventing it.

V. W. B.—On adding nitric acid to oil of amber, the acid is decomposed, nitrous gas being evolved and the oil being oxidized, forming what is called "artificial musk."

A. F. **Porter.**—(1.) No.—(2.) When wood is burned under a glass, carbonic acid is formed; the vapour observed consists of this, together with moisture, acetic acid and other volatile matters emanating from the wood.—(3.) Dr. Gregory's powder is sometimes called "pulvis rhei comp."

B. P. (Grantham).—We are not able to state when the work will be published.

T. N. (Lincoln).—The Druggist was not justifiable in advising the addition of croton oil to the electuary. Such powerful medicines should never be given at random, and ought only to be prescribed by medical practitioners.

Maldon.—When cardamom seeds are ordered, the seeds should be used without the "pods."

W. W.—Ammonio-citrate and ammonio-tartrate of iron, are dried by placing a thin layer of the solution on a warm plate or tile.

Mr. Shepherd, in answer to a Correspondent, M. A. C., gives the following formula for *tincture of camphor with castor and opium*:—℞ P. opii; castorei; camphoræ, āā ʒij.; potas. supertart, ʒss.; cocci cacti, ℈ss.; Sp. vini gallici, oj. Macera per dies septem. Dose—A teaspoonful in a glass of water. [We should be glad to know on what authority this formula is given.]

B. D. F.—In addition to the works named, we should recommend Dr. Christison *On Poisons*, *Selecta è Prescriptis*, and especially Phillips's *Translation of the Pharmacopœia.*

A London Associate.—There is no authorized formula for Compound tincture of quinine. It is sometimes prepared as follows:—℞ Quinæ disulph. gr. viij.; Acid sulph. dil. gutt. viij.; Tinct. aurantii ℥j. M.

"Juvenis."—To make liq. ammon. acet. concent., saturate the strong acetic acid instead of the diluted with carbonate of ammonia.

"Philo."—We think *The Manual of Chemistry*, by Mr. Fownes, likely to answer the purpose.

T. M. P. S.—Bandoline; see vol. iii., page 94.

"Daleth," M.P.S.—(1.) Turner's *Chemistry*, new edition by Liebig.—(2.) Lindley's *Vegetable Kingdom*, see page 518.

C. G.—There are two methods extensively adopted by the soap manufacturers for bleaching palm oil: the first consists in heating the oil in contact with chromic acid; the second in merely exposing it in very shallow cisterns to the action of the atmospheric air, and heated by steam-pipes passed through it.

"Ferrum."—For the method of constructing a galvanic battery with iron plates, see vol. i., page 501.

Scientiæ Discipulus, having consulted the writings of Baron Fournier, Baron Humboldt, and other eminent authors, with reference to the cause of *earthquakes*, wishes us to decide between the conflicting theories which have been proposed to explain these phenomena. We should be guilty of much presumption in undertaking such a duty. We believe the opinions of philosophers are as much divided as ever they were on this subject; nor is it probable that any certain knowledge will ever be acquired with reference to it.

I. T. L.—The phenomenon alluded to has been frequently observed to occur under a variety of circumstances, but no satisfactory explanation of it has been given.

D. F.—Dragon-root is said to be the root or rhizome of a species of Arum, growing abundantly in North America. We do not know what is used for colouring it.

Advertisements to Mr. Churchill, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. Smith, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to The Editor, 338, Oxford Street, before the 20th of the month.

THE PHARMACEUTICAL JOURNAL.

VOL. V.—No. XII.—JUNE 1st, 1846.

THE EXAMINATION OF CHEMISTS & DRUGGISTS.

THE main feature of the proposed Pharmaceutical Bill is the establishment of a compulsory examination for future Chemists and Druggists. The machinery of the Bill consists merely of an arrangement for constituting a competent Board of Examiners, and the penalty clauses are introduced for the purpose of making the examination compulsory. All the other parts of the Bill are matters of detail subservient to the one grand object; namely, the establishment of an efficient and compulsory examination.

When we observe the universal consent with which all parties acknowledge the importance and necessity of this measure, there can be no reason to doubt that either the proposed Bill or an enactment similar in tendency and effect, will shortly become the law of the land.

Our readers will observe that the draft of the Bill was favourably received at the General Meeting of the Members of the PHARMACEUTICAL SOCIETY; which, we may remark, was the most satisfactory Anniversary which has occurred since the establishment of the Society. The prevailing sentiment among all present appeared to be a desire to co-operate for the general good, and to advocate zealously that course which, after mature deliberation, might seem most likely to conduce to this result. On the main feature of the proposed Bill the meeting was unanimous; the objections urged against some of the details were such as admitted either of an easy remedy or explanation; and the arguments on these points were carried on in the best possible temper, and at the same time with sufficient spirit to show that the Members took a real interest in the subject.

The only positive objection urged against the proposed plan, was the fear that the creation of a new body with legislative powers for conducting the examinations, might possibly prove detrimental to the welfare of the PHARMACEUTICAL SOCIETY, transferring the influence to the proposed College, and thus *apparently* superseding the necessity of keeping up the voluntary Institution. On this subject we intend to take an early opportunity of offering a few remarks, feeling persuaded that the PHARMACEUTICAL SOCIETY would not permanently suffer from the proposed arrangement, and that if a few of the Members should secede from it under an erroneous impression, they would soon be anxious for readmission, on the real position of the Society, as a Scientific Institution, becoming manifest. It is satisfactory, however, to observe that so general a desire prevails to uphold an Institution which has within the last five years commended itself to the good wishes of the Members.

While, however, this *esprit de corps* was sufficiently prevalent at the Annual Meeting, it was not forgotten or overlooked that the Society was established for the trade at large, and that the object in view from the commencement was to introduce into this country proper and efficient legislation for all Pharmaceutical Chemists. The liberal nature of the proposed plan was therefore in accordance with the sentiments of the Members generally, who appeared fully sensible that the undertaking before us is not a matter relating merely to a few individuals, but a public measure, in which the interests of the whole medical profession are concerned.

The friendly co-operation of the College of Physicians is what we have always had reason to anticipate, not only from the disposition expressed by that body on several occasions to promote an improved education among Chemists and Druggists, but also on account of the fact that the Physicians are as much interested in the result as the Chemists themselves. Whatever regulations might be introduced for raising the qualification of dispensers of medicine, would at the same time tend to increase the public confidence in those who prescribe the remedies.

We beg to refer our readers to the report of the late interview of a Deputation of the PHARMACEUTICAL SOCIETY with the President and Censors of the College of Physicians, the result of which is highly important to our body.

Although the President observed to the Deputation, that the interview must not be considered an official meeting with the College, yet the sentiments expressed on the occasion, coming from such high authority, demand our most serious attention, and afford a satisfactory indication of the favourable sentiments entertained by that body, in reference to the objects we are endeavouring to carry out.

In the draft of the Bill which the Council had prepared, it was not assumed that the College of Physicians would desire to take an active part in the examination of Pharmaceutical Chemists; at the same time this has always been considered an open question, and the Council were quite prepared for the proposition on the part of the College, to which, we imagine, no objection could be urged. The Physicians, being the "natural allies" of the Chemists, and being interested in raising the character and position of our body in a Pharmaceutical capacity, will not only aid us in the attainment of the desired object, but their co-operation will give increased importance and character to the Board of Examiners and the Institution to which they belong. If the formation of a joint Board should eventually be decided on, the machinery of the proposed Bill must be in some respects modified, and this will require further consideration.

No official communication has taken place with the General Practitioners on the subject of the proposed Bill, but we have heard the opinions of several influential members of that body, from which it appears that the only objection of any importance urged against the plan, is the fear that the Chemists and Druggists might by degrees extend their *curriculum* of education and become medical men. We fully unite in opinion with those who would deprecate this result, believing, as we do, that the professional and commercial prosperity of our body will depend to a great degree on our advancement in our own legitimate department, and the attainment of a scientific character as Pharmaceutical Chemists. The experience of the General Practitioners should be a warning to us to avoid the course which that body has taken in this respect, and if any further security against innovation were desired, we cannot imagine a more effectual one than the union with the College of Physicians in the formation of a Board of Examiners, as the influence of the College would always be sufficient to keep the Chemists in their proper place.

PENALTIES UNDER THE STAMP DUTIES ACTS.

Several prosecutions have lately been commenced for the recovery of penalties stated to have been incurred under these Acts.

It would scarcely be within our province to enter upon a discussion of the policy of the Government in seeking to raise a revenue by means of stamp duties to be paid on the sale of medicines, whereby a tax is exacted from those who are already suffering from some malady, and are perhaps incapacitated from any bodily or mental exertion. Nor do we consider ourselves called upon to offer any opinion on the practice of some Chemists, in wrapping up articles sold by them, in printed papers describing their wonderful efficacy in particular cases. Some may deem such a course of proceeding as legitimate on their part, and as beneficial to the public; while others may consider it as the puff direct, and derogatory to the regular Chemist.

We propose in the present article to deal with this question only as regards the consequent liability of the parties to penalties under the Medicine Stamp Duties Acts.

While the statutes now in force exist, it behoves all Chemists to make themselves practically acquainted with their details, that they may not be unexpectedly placed in the disagreeable position of having an action brought against them for having committed a breach of some of their provisions.

Many of our brethren are, we are informed, in the habit of selling articles, such as Gregory's Powder, Essence of Ginger, or similar articles, without stamps, and wrapping up the article sold in, or otherwise delivering with it, a paper descriptive of the qualities of the medicine, and stating some cases in which its use would be found to be beneficial.

It is under these circumstances that actions have lately been commenced against respectable parties for the recovery of penalties of £10 each, stated to have been incurred by them.

Now, as every man is presumed to be acquainted with all existing laws, however complex they may be, we fear that it will be of no avail to plead ignorance of the Acts of Parliament in question.

Considerable excitement has on various occasions been caused by prosecutions being commenced under these Acts; and in 1829, on the occasion of the informers being at work, Mr. Price (barrister) was employed, by the Associated Chemists, to revise the several Acts relating to their trade; and he drew up, in the form of a pamphlet, an abstract of the Medicine Stamp and Licence Acts, with observations on their legal effect and operation. This pamphlet was published for the benefit of the trade; but we expect that most of our friends will, after perusing it, concur with us, that to the trade at large this treatise is practically useless, and that though the learned gentleman has displayed considerable talent in exposing various discrepances in the several Acts, which have from time to time been passed to regulate the licences to vend, and the stamp duties payable on, certain medicines, he has totally omitted to point out in a familiar and comprehensible form, the various shoals and quicksands on which the unfortunate Chemist may be wrecked, and ruined before he is aware of his danger.

We subjoin a reference to the Acts now in force, for the assistance of such of our readers as may desire to refer to them, and we have endeavoured to extract the leading features of the Acts; though, in a penal Act of Parliament, nothing short of the perusal of the whole Act can effectually make parties aware of the pains and penalties to which they may become subject. We regret that we have not space to give the very long Schedule to the last Act, by which upwards of 500 compounds (many of which are in common use) are specifically charged with stamp duty.

In conclusion, we recommend all Chemists to revise their labels and wrappers; as it appears to us that any statement printed, or written and delivered with, or affixed to any article sold, holding it out or recommending it as beneficial for the prevention, cure, or relief of any malady, renders it subject to stamp duty; and consequently, that so selling any such article, without the stamp duty being affixed, renders the seller liable to the penalties imposed by the Act.

It will also be observed that the duties charged by the 52d Geo. III., c. 150, include specifically not only the scheduled articles, but also (*inter alia*) any article, however well its composition may now be known, which has been the subject of letters patent under the great seal of Great Britain.

The Acts of Parliament now in force for the regulation of the vending of medicines, commonly known as patent or proprietary medicines, are 42d Geo. III., c. 56; the 43d Geo. III., c. 73; the 44th Geo. III., c. 98; and 52d Geo. III., c. 150.

By the 42d Geo. III., c. 56, certain previously existing Acts were repealed. Duties were levied on certain packets of medicine, &c., described in the schedule to the Act, and on all articles of like description. All persons selling, &c., such medicines were required to take out annual licences. This Act contains the machinery now in existence, for regulating the trade in such medicines, for enforcing payment of the duties, and for the recovery of the penalties for acting in contravention of the Act.

By the 43d Geo. III., c. 73, a new schedule of medicines liable to duty was substituted for that contained in the 42d Geo. III., c. 56, and some new regulations for the conduct of the trade in such medicines were enacted. The sixth section of this Act provides that no prosecution or other proceeding shall be had for enforcing payment of any penalty under the 42d Geo. III., c. 56, except in the name and by the authority of the Attorney General, or in the name of some one authorized by the Commissioners of Stamps. This is an important protection to the trade, as Chemists would otherwise have been open to prosecutions by common informers.

The 44th Geo. III., c. 98, merely substituted a further new schedule of the medicines to be thereafter liable to the duties imposed by the 42d Geo. III., c. 56.

The 52d Geo. III., c. 150, substituted a new schedule of articles to be thenceforth liable to the duties under the 42d Geo. III., c. 56. The schedule is too long to permit our transcribing it; but it concludes with the following clause :

> "And also all other Pills, Powders, Lozenges, Tinctures, Potions, Cordials, Electuaries, Plaisters, Unguents, Salves, Ointments, Drops, Lotions, Oils, Spirits, Medicated Herbs and Waters, chemical and officinal Preparations whatsoever, to be used or applied externally or internally, as Medicines or Medicaments for the Prevention, Cure, or Relief of any Disorder or Complaint incident to or in any wise affecting the human Body, made, prepared, uttered, vended, or exposed to sale by any Person or Persons whatsoever, wherein the Person making, preparing, uttering, vending, or exposing to sale the same, hath or claims to have any occult Secret or Art for the making or preparing the same, or hath or claims to have any exclusive Right or Title to the making or preparing the same, or which have at any time heretofore been, now are, or shall hereafter be prepared, uttered, vended, or exposed to sale under the authority of any Letters Patent under the Great Seal, or which have at any time heretofore been, now are, or shall hereafter be *by any Public Notice or Advertisement, or by any written or printed Papers or Hand-Bills, or* by any Label or Words *written* or *printed, affixed to or delivered with* any Packet, Box, Bottle, Phial, or other Inclosure containing the same, *held out or recommended* to the Public by the Makers, Vendors, or Proprietors thereof as *Nostrums or Proprietary Medicines*, or as Specifics, *or as beneficial to the Prevention, Cure*, or *Relief* of any *Distemper, Malady, Ailment, Disorder, or Complaint incident to or in anywise affecting the human Body.*"

The Act then also contains the following special exemptions :—

SPECIAL EXEMPTIONS.

"All Drugs named or contained in the Book of Rates subscribed with the name of Sir Harbottle Grimstone, Bart., and mentioned and referred to by the Act of Tonnage and Poundage, made in the twelfth year of the reign of King Charles the Second, and in another Book of Rates, intituled 'An additional Book of Rates of Goods and Merchandizes usually imported and not particularly rated in the Book of Rates referred to in the Act of Tonnage and Poundage, made in the Twelfth Year of the Reign of King Charles the Second, with Rules, Orders, and Regulations, signed by the Right Honourable Spencer Compton, Speaker of the Honourable House of Commons, and mentioned and referred to by an Act made in the Eleventh Year of the Reign of His Majesty King George the First.' "

"All medicinal drug or drugs whatsoever, which shall be uttered or vended entire, without any mixture or composition with any other drug or ingredient whatsoever, by any Surgeon, Apothecary, Chemist, or Druggist, who hath served a regular apprenticeship, or by any person who hath served as a Surgeon in the navy or army, under any commission or appointment duly entered at the War Office or Navy Office, or by any other person whatsoever licensed to sell any of the medicines chargeable with a stamp duty."—(42 Geo. III., sec. 4th.)

"And also all mixtures, compositions, or preparations whatsoever, mixed or compounded with, or prepared from medicinal drugs, medicated or chemical preparations or compositions, or other ingredients bearing different denominations, or having different properties, qualities, virtues, or efficacies, which shall be uttered or vended by any such Surgeon, Apothecary, Chemist, or Druggist as aforesaid, or by any such person who hath served as a Surgeon in the navy or army, under any such commission or appointment as aforesaid, the different denominations, properties, qualities, virtues, and efficacies of which mixtures, compositions, and preparations as aforesaid *are known, admitted, and approved of*, in the prevention, cure, or relief of any disorder, malady, ailment, or complaint incident to, or in anywise affecting the human body: and wherein the person mixing, compounding, preparing, uttering, or vending the same, hath not, nor claims to have, any *occult secret, or art, for the mixing, compounding, or preparing the same*, nor hath, nor claims to have, any exclusive right or title to the mixing, compounding, or preparing, or to the vending of the same, and which mixtures, compositions, or preparations have not been, are not, nor shall hereafter be prepared, uttered, vended, or exposed for sale, under the authority of any letters patent under the great seal, nor at any time heretofore have been, now are, or hereafter shall be, *by any public notice, advertisement*, or by any written or *printed papers, or handbills, or by any labels or words written or printed* and affixed to, or delivered with, any such packet, box, bottle, pot, phial, or other inclosure aforesaid, *held out or recommended* to the public by the owners, proprietors, makers, compounders, *original or first vendors thereof, as nostrums or proprietary medicines*, or as specifics, *or as beneficial for the prevention, cure, or relief* of any such distemper, malady, ailment, or complaint as aforesaid."

THE SALE OF POISONS.

In the *Stockport Improvement* Local Act, now before Parliament, the following clause was inserted respecting the sale of poisons—clause 181:

"And be it enacted, That every person who shall sell arsenic or prussic acid, *or any other well known deadly poison*, to any person apparently under the age of twenty-one years, or to any person whatever, except in the presence of two witnesses, and without correctly entering in a book the name and address of such witnesses and person purchasing, as well as the

quantity purchased, and the purpose for which it is intended, shall forfeit a sum not exceeding five pounds, to be recoverable as any penalty imposed by this Act."

This clause, with the exception of the words printed in italics, exists in the Manchester Local Act, which has been for some time in force, and the addition was made for the purpose of more effectually checking accidents from poison. But the Chemists of Stockport perceiving that this general denunciation of poisons would include all active medicinal substances, and thus interfere seriously with their ordinary business, remonstrated against the alteration.

Nearly all the preparations of mercury, lead, copper, antimony, zinc, and iron, narcotic extracts, tinctures and syrups, drastic purgatives, mineral and vegetable acids, alkalies, preparations of iodine, the vegetable alkaloids—in fact, nine-tenths of the Materia Medica—are poisons more or less deadly when taken in excessive doses. If therefore the above law were to pass, the Chemist would be liable to constant annoyance, since the conscience of the informers would be left to decide which of these articles should be considered poisons in the operation of the Act. In reply to this objection, which was urged by the Chemists of Stockport, it was stated that the Act would be interpreted and administered with due moderation, common informers having no power under it, and the object being to protect the public without obstructing the general business of the Chemist. This would probably be the case so long as the framers of the Act continued to administer it; but experience has shown that when the working of Acts of Parliament comes into fresh hands, the precise words become the law, while the original intention is forgotten. Supposing an ingenious logician to come into office, he might soon discover a field in which to display his talent; and taking a work on toxicology as his text-book, might extend the operation of the Act to all substances therein mentioned, which would include the bulk of the Materia Medica.

Consequently the above answer to the objection was not considered satisfactory, and the subject was referred to the Council of the Pharmaceutical Society, who fully concurred with their brethren at Stockport in the opinion, that the clause, with the additional words, was objectionable *on principle.*

Application was made on behalf of the Society to Mr. Cobden, whose name stands first on the Bill, and that gentleman, on hearing the case represented, admitted the validity of the objection, and referred the matter to Mr. Coppock, the Parliamentary Agent. After a little correspondence, the promoters of the Bill consented to withdraw the objectionable words, leaving the clause as it stands in the Manchester Local Act.

THE PRIVILEGES OF QUACKS.

THE Quack is a privileged man. He is subject to no law either human or divine: he bids defiance alike to the laws of nature and the rules of any known or recognised art: he professes to have a system of his own, deduced from innumerable observations and extensive experience, by a method of reasoning peculiar to his own genius. The most essential requisite in the system is originality;—it must differ from all others, and should be a compound of a certain amount of truth with an indefinite quantity of twaddle. The great art consists in adjusting the proportions of these ingredients so as to suit the capacity of each patient, and for this purpose a knowledge of human nature is particularly necessary. Some persons may swallow the whole system at once, others must be brought to it by degrees, being more disposed to think for themselves, and to take for granted no more than they can digest, like a man who swallows the oyster, rejecting the shell. For such persons the shell must be pounded and administered by small portions at a time; for until the whole oyster is swallowed, or in other words, until the patient has implicit reliance on the mysterious efficacy of the entire system, he will not be tractable.

The chief requisite in the quack is impudence. He must possess the faculty of stating what is incredible with the air of a person who actually believes what he says; and must have the tact to let down his dupe gently from the heights of astonishment to the abyss of blind credulity.

The first thing to be done, therefore, is to gain the full confidence of the patient by citing a few appropriate and wholesome maxims, distorted more or less to suit the particular system, which is bolstered up with a list of wonderful cures, ingeniously contrasted with another list of deaths and disasters under other systems. This primary object effected—the patient being reduced to a state of blind reliance and implicit docility—the quack possesses an advantage not always enjoyed by the regular practitioner. Whatever orders he gives are rigidly obeyed. If he directs the patient to go to bed at ten o'clock, instead of two in the morning, to rise at seven and walk for an hour before breakfast, to drink one glass of wine at dinner, or none at all, instead of a bottle, to live on beef and mutton, abstaining from unwholesome dishes, to bring about, in fact, an entire revolution in his artificial habits of life, these orders will be observed with the most scrupulous attention. In addition to such regulations, which may be considered the "truth" of the system, but which of themselves would not appear sufficiently important to awaken the requisite amount of faith, some novelty must be resorted to as a means of amusing the patient and completing the charm of the system. A globule of sugar must be placed on the tongue (like a pinch of salt on a bird's tail), or certain ablutions must be performed (a very wholesome practice within due bounds), or some quack medicine must be swallowed (the nature of which is known only to the inventor), frictions, shampooing, or other auxiliaries, according to the nature of the system, form a part of the treatment, and share the credit if relief be obtained. The quack need not be deeply versed in medical knowledge. The word *diagnosis* is not in his dictionary, and it is of little moment to him what is the name of the disorder. But his *forte* is in *prognosis*, and he classifies patients into curable and incurable. The former are such as are not obviously suffering from any serious or organic disease; the latter he is careful to avoid if possible, or, when requisite, he sends them to a distance for change of air, and thus escapes the responsibility.

In some of the water-cure establishments, a leading regulation is to the effect that no remedy but water is allowed; and any patients who may be dissatisfied without taking medicine are respectfully requested to leave the establishment. This is an excellent method of weeding the establishment of bad cases, and increasing the average number of cures, by retaining only such persons as require no medicine, but merely a change in their habits of living; and for such persons a well regulated boarding-house, with facilities for bathing, is a decided advantage.

The quack may occasionally make a mistake and undertake the cure of a patient whose malady is more serious than he expected. In this case, he attributes the failure of his system to some accidental omission in the performance of his prescribed routine of treatment. If he undertakes (as some quacks are in the habit of doing) to return the money unless a cure be effected, he is generally safe, for if the patient recovers he has no claim, if he dies he never asks for his money, and if he lingers on without making much progress, some plausible excuses or explanations are invented for the purpose of throwing the blame upon himself.

The medical practitioner does not enjoy these advantages. He is considered to be a reasonable man, and he treats his patients like reasonable beings: he prescribes what he thinks likely to afford relief, whether in the form of medicine, diet, mode of living, or other directions applicable to the particular case. Unfortunately the practice of remunerating Apothecaries in proportion to the quantity of medicine administered, has tended to give an undue importance to this part of the treatment, and patients are apt to imagine that if they take the medicine regularly, the other orders of the doctor are secondary in importance. It is inconvenient to give up the ordinary recreations and amusements of society, late hours, the indulgence of the table, and other luxuries; and unless a patient be so ill as to be confined to his room, he is constantly tempted to deviate in some respects from the routine prescribed. He considers the doctor responsible. He has taken his medicine, and if he has indulged in an extra glass of wine, or curtailed his rest by later hours than his doctor allows, this is what he has often done before, and he scarcely thinks the circumstance worth mentioning. The Physician has no new and mysterious system to fall back upon, no asylum in which to watch the movements of his patients, and presuming upon the supposition that the patient knows better than to violate his instructions, his cross-examination is less severe than that of the quack, and while he is exerting his whole skill and experience, all his care may be frustrated.

Supposing this to be the case, and the patient, being discouraged at the result of his own imprudence, is recommended to try some new system. He goes to Baden-Baden, or to Graeffenberg, or perchance to some similar establishment in his own country. His habits of life are changed; he is induced to attend to advice which he disregarded when given by his regular medical attendant, and by avoiding what was probably the chief cause of his malady, his health is improved.

Some persons are in the habit of taking a large quantity of medicine without medical advice. They keep a debtor and creditor account with their stomachs, and after any excess or imprudence in diet, take a counteracting dose. When at fault they consult a doctor, forgetting probably to mention their prophylactic propensity. It is not surprising that the constitution is sometimes injured by such habits, which are allowed to continue because they are not known to prevail. But if a patient under these circumstances happen to consult a homœopathist, the evil is remedied without any direct opposition to the prevailing prejudice: for medicine is administered as usual, while the dose is reduced to a shadow, and the doctor will only attend on condition that certain rules in diet and habits of life are observed, which he represents as being requisite in order *to ensure the proper effect of the globules.*

Medicine, like fire, is a good friend but a bad enemy. When injudiciously indulged in, it does mischief, which injures the profession by giving the quack an opportunity of rectifying the evil by the substitution of an imaginary remedy, amusing the patient without producing any other effect. To this circumstance, aided by proper attention to diet, may be attributed the credit homœopathy has acquired among some persons of lively imagination.

So much for what may be called anti-pharmaceutical quackery, which is rather of a high order, being patronized by the nobility and gentry. Ordinary quacks prefer the Apothecaries system; that is to say, they remunerate themselves by the sale of medicines. Of this class "Dr." Morison was a star, and the extent to which he carried purgation was frightful. In quackery one extreme answers as well as the other, and the more astounding the theory and practice inculcated, the more completely the reason of the dupe is paralysed. We have observed that there are some persons who habitually take too much medicine, there are others again who take none at all, or pay so little attention to the state of their alimentary canal, that they suffer a variety of ailments in consequence. While the former are benefited by homœopathy, the latter find relief in the system of Morison and Co., which is nothing more than Abernethy's hobby ridden to death. Morison's range of dose being from one pill to thirty, each patient could act according to his amount of faith or constipation, and thus in some cases we hear of wonderful cures having been effected, while in others, where faith was in excess, the result was fatal. The quack himself being concerned merely as the maker and vender, managed in general to escape direct responsibility, while those who administered his panacea to patients who died in consequence, were convicted of manslaughter.

St. John Long depended for his success on the principle of counter-irritation, and reduced to a general law a line of treatment adopted by medical men only in appropriate cases. This generalization constituted the novelty of his theory, and the recklessness with which he carried it out led to its downfall. He was not satisfied with *cure*, but was professor of *prevention*; and in some cases prevented death from consumption by a summary process leading to the same result, before the symptoms of consumption had manifested themselves. Although convicted of manslaughter, his friends supported him to the last, and a splendid monument was erected to his memory in the cemetery at Kensall Green.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

ON THE TREE YIELDING AFRICAN OLIBANUM.

BY J. FORBES ROYLE, M.D., F.R.S.,
Professor of Materia Medica and Therapeutics in King's College, London.

(*Read at 17, Bloomsbury Square, the 8th of April*, 1846.)

THE name *Olibanum* is probably derived from the Greek λιβανος, and this probably from the Hebrew *lebona*, which is very similar to the Arabic *luban*. This word signifies *milk*, and also the juice exuding from a tree, and is applied especially to what used in early times to be called *Thus*, or Frankincense, and more recently *Olibanum*.

The ancients were acquainted with two kinds of Olibanum, one Indian, the other Arabian. The latter was said to be produced in the country they called *Thurifera*. Arrian, in the Periplus of the Erythræan, or Red Sea, mentions Olibanum as exported as well as Myrrh from the coast of Barbaria, which is thought to be the modern Berbera. Avicenna states that it is brought to a town called Merbat, on the sea-coast. "Hôc ex loco multa thuris confecti copia evehitur, quô mercatores negotiantur.*" Garcias, writing at Goa, says that no *Thus* is produced in India, and that the whole of what is exported to Portugal is first imported from Arabia. "Confluere eo negotiatores ex Adem (Aden), Xaël [Zeyla of the coast of Africa?] et aliis Arabiæ locis et cum Rege de Thuris quantitate quam avecturi sint, et de pretio convenire solere, etc. By Pomet, Lemery, and others it is described as of two kinds, male and female. Most authors say that one kind is produced in India, the other in Arabia.

In the Bible we have frequent notices of *lebona* (translated *Incense* and *Frankincense*), which was probably Olibanum, as, like it, it was employed as incense. In a few passages we learn that it was brought from a far country, as in Isaiah lx. 6, "The multitude of camels shall cover thee, the dromedaries of Median and Ephah; all they from Sheba shall come; they shall bring gold and *incense*." So Jerem. vi. 20: "To what purpose cometh there to me, *incense* from Sheba and the sweet cane from a far country?" In the New Testament we have the term λιβανος used. Matthew ii. 11: "And when they were come unto the house, and when they had opened their treasures, they presented unto them gifts; gold, and *frankincense*, and myrrh."

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* See the Article *Kondor*, or *Thus*. Avicenna ed. of Pemplius, p. 160.

Two kinds of Olibanum are known in commerce, one Indian, the other African.

The Indian is imported in chests, chiefly from Bombay, but also from Calcutta. The place of produce, however, is not well ascertained. Mr. Turnbull, of the Medical Service, many years since sent some resin of the *salai* tree, collected in the hills near Mirzapore, which in the London market was recognised as Olibanum. Mr. Colebroke determined that *luban* or Olibanum is produced by a tree called *salai*. I have also collected from the *saleh* tree of the north-west of India, a very fragrant resin which bears a very close resemblance to common Olibanum. This tree is *Boswellia glabra Roxb.*, the former is *B. thurifera* of Colebrooke, called *B. serrata* in many works; but, as Messrs. Wight and Arnott say, "we do not quote here *B. serrata, Stack. ext. Bruc. p.* 19, *t.* 3. The leaves being usually described as ovate, oblong, and acuminated." Both species are contained in Col. Sykes's collection made in the Deccan.

Dr. O'Shaughnessy states that he has received fine specimens of Olibanum from the Shahabad district, where it is called *Sale gond*, gum of the *Sale* tree; but at Chandalgur, *Gunda berosa*.

Boswellia thurifera grows to a large size in hilly situations from the coast of Coromandel to central India. It is much branched, but bare of leaves in its lower part, but these are crowded and alternate towards the ends of the branches, unequally pinnate. Leaflets oblong, obtuse, serrated, pubescent. Stipules none. Inflorescence in simple axillary racemes near the ends of the branches, shorter than the leaves. Flowers on short pedicels, of a pinkish-white colour. Flowers bi-sexual. Calyx small, five-toothed. Petals five, obovate, tapering to the base, inserted under the margin of the disk; æstivation slightly imbricative. Disk surrounding the base of the ovary, cup-shaped, fleshy, crenulated. Stamens ten, inserted under the disk. Ovary sessile, three-celled, with two ovules in each, attached to the axis. Style terminated by a capitate three-lobed stigma. Fruit capsular, three-angled, three-celled, three-valved, septicidal (splitting at the angles into valves). Seeds solitary in each cell, girded by a membranaceous wing. Cotyledon intricately folded, multifid.

Indian Olibanum, which is now the most esteemed, is in roundish or oblong tears, of a reddish or a light-yellow colour, usually covered with whitish powder from attrition of the pieces against each other, translucent within, of a warm bitterish taste, and having a balsamic odour, especially when warmed or burnt. Sp. gr. 1.22. Analysed by Dr. O'Shaughnessy, a fine specimen gave, of resin 37 parts, volatile oil 28 parts, gum 4, gluten 11, in 100 parts; but the quantity of volatile oil is necessarily much less when Olibanum has been exposed to the air, and the resin become dry, which is the state it is usually seen in in commerce. Bracannot obtained only 5 per cent. of volatile oil, of resin 56, gum 30, substance like gum 5.2, loss 0.8=100.

The AFRICAN or ARABIAN OLIBANUM is in yellowish tears and irregular reddish lumps or fragments. The tears are generally ovoid, oblong, or rounded, not very brittle, with a dull and waxy fracture, softening in the mouth and bearing much resemblance to mastic, from which, however, they differ in their want of transparency. The reddish masses soften in the hand, have a stronger smell and taste than the tears. Both Lieut. Wellsted and Mr. Johnston state that large quantities of Olibanum are exported from the Somauli coast.

African Olibanum, known on the continent as *Encens d'Afrique* and *Africanischer Weihrauch*, is imported into Venice and Marseilles from Suez, being obtained from Arabia and the east coast of Africa. Dr. Pereira, who mentions it as African or Arabian Olibanum, describes it as being in smaller tears than the Indian variety, yellowish or reddish, and intermixed with crystals of carbonate of lime. Dr. Malcolmson writes to me from Aden, that large quantities of Olibanum are produced in Africa, principally on the high and extensive range of limestone hills of the Somauli coast, which are in the vicinity of Cape Guardafui. Captain Kempthorne, of the Indian navy, describes the tree which produces frankincense on these hills, at about 1000 feet of elevation in the neighbourhood of Bunder Maryah, and that the Olibanum is carried to the Arabian shore by boats from Maculla. "The tree attains a height of about forty feet, firmly attached to the bare limestone rock, by a thick mass of vegetable substance (part of the tree), which sends roots in the crevices of the rock to an immense depth."—*Malcolmson*. Captain K. describes the bark as consisting of four different layers. The outermost of all is very thin, and similar to that of the beech. The two next are of a singularly fine texture, resembling oiled letter-paper, perfectly transparent, and of a beautiful amber colour. It is used by the Somaulis to write upon. The inner bark of all is about an inch thick, of a dull reddish hue, tough, and not unlike leather, but yielding a strong aromatic perfume. The wood is soft and white. By making a deep incision into the inner rind, the gum exudes profusely, of the colour and consistence of milk, but hardening into a mass by exposure to the atmosphere." By this bark, of which he received a specimen from Major Harris, Mr. Bennett, of the British Museum, has been able to identify it as being very similar to that of a tree, of which specimens were collected by Schimper in his Abyssinian journey, on the mountains below Dacheladschezanne. It flowers in December, and ripens its fruit in April. Of this the Abyssinian name is stated to be *makker*. It has been named *Plösslea floribunda* by Endlicher, in *Nov. Stirp. Mus. Vindob.*, *Decad.*, No. 47, and figured in *Iconogr.* t. 129. 130. He has attached it in his *Genera Plantarum*, p. 1073, as an anomalous genus to *Sapindaceæ*.

On seeing the plant, I was instantly struck with its resemblance to a species of Boswellia, and mentioned my opinion to Mr. Bennett that it must be too closely allied to be far separated from it. On comparing the description of the two genera as given by Endlicher himself, I can find no character by which the one can be justly separated from the other.[*] The capsule of

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SAPINDACEÆ. Genus *Anomalum*.	BURSERACEÆ.
PLÖSSLEA, *Endlicher*. Gen. Plant., p. 1073.	BOSWELLIA, *Roxb.* *Endl.* p. 1135.
Calyx 5-fidus, æqualis.	*Calyx* parvus, 5-dentatus, persistens.
Discus adnatus.	
Corollæ, petala 5, disci basi extus inserta, æqualia, ungue nudo.	*Corollæ* petala 5, sub *disco* annulari carnoso, crenulato inserta, obovato-oblonga, basi angustata, æstivatione subimbricata, sub anthesi patentissima.
Stamina 10, cum petalis inserta.	*Stamina* 10, hypogyna, alterna petalis opposita breviora.
Filamenta libera, subulata.	*Filamenta* subulata, persistentia.
Antheræ introrsæ, biloculares, basi emarginata insertæ, longitudinaliter dehiscentes.	*Antheræ* introrsæ, biloculares, ovato-oblongæ, basi emarginatæ, longitudinaliter dehiscentes, caducæ.
Ovarium sessile, triloculare.	*Ovarium* sessile, triloculare
Ovula in loculis gemina, anguli centralis medio inserta, oblique contigua, peltatim amphitropa, micropyle supera.	*Ovula* in loculis gemina, collateralia, pendula.
Stylus terminalis, crassus.	*Stylus* brevis, staminum longitudine.
Stigma depresse subcapitatum, obsolete trilobum.	*Stigma* capitatum trilobum.
Capsula clavata, trilocularis, trivalvis, valvis cum septis alternantibus, columnam tripteram, alis septantem, faciebus seminiferam nudantibus.	*Capsula* drupacea, trigona, trilocularis, septicide trivalvis, valvarum endocarpio subosseo.
Semina in loculis abortu solitaria, triangularia, basi et apice in cuspidem producta, testa ossea, dorso membrana lacerula tecta, umbilico ventrali, nucleum multoties minorem, integumento tenuissimo includente.	*Semina* in loculis abortu solitaria, inversa, compressiuscula, margine membranaceo lato cincta.
Embryonis exalbuminosi leviter arcuati.	*Embryonis* exalbuminosi
Cotyledones foliaceæ, trilobæ, convolutæ.	*Cotyledones* contortuplicatæ, multifidæ.

Plösslea differs in being clavate, but the normal structure of the two is the same. In his *Enchirid. Botanic.*, p. 563, Endlicher mentions "*Plössleæ floribundæ*, ex Africæ penetralibus nuper relatæ, ramuli gummi assudato consiti sunt." The specimens in the British Museum are covered with little pellucid tears of a resinous substance, which must be of the nature of Olibanum. I have, moreover, specimens of leaves collected by the late Lieut. Wellsted in the Island of Socotra, which is 200 miles to the eastward of Cape Guardafui. To these leaves a note is attached —"Species of *Uckshai*, found near Rass Dome, about 12 feet high, smooth purple bark, when pierced a white milky substance exudes." These I have always considered to belong to a species of Boswellia, which I temporarily named *B. africana.* Its leaves display indications of resinous exudation. It would be probable, therefore, even without further evidence, that a species of Boswellia might yield the Olibanum of Africa, as *B. thurifera* and *B. glabra* do that of India. This I had long thought probable, as I stated in No. VI. of my *Illustr. of Himalayan Botany*, 1835: "From the affinity in vegetation between parts of Arabia, Persia, and India, it is not impossible but the genus *Boswellia* may extend into other countries, and afford that which is known as Arabian Olibanum," p. 177.

If we, however, compare the information afforded by Captain Kempthorne with that of Dr. Malcolmson, including the fact that large quantities of Olibanum are imported into Aden, and from the Arabian Gulf (which includes the commerce of Africa) into Bombay, there can be no doubt that some of the Olibanum of commerce is produced on the east coast of Africa. If we further consider the identification by Mr. Bennett, of the bark given him by Major Harris with that of the tree called *Plösslea floribunda*, and of the probability of this being nothing but a species of *Boswellia*, this may be called *B. floribunda.* There is every probability therefore that the Olibanum-yielding tree described by Captain Kempthorne is this *Boswellia*, and that it yields one kind of African Olibanum. The only difficulty is in the absence of authentic specimens of the tree and its product,

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Radicula supera.	*Radicula* supera.
Arbor Africæ tropicæ; florescentiæ tempore aphylla, paniculis in apice ramorum confertis, multifloris.	Arbores Indicæ, Elaphrii facie, resiniferæ, balsamifluæ; — racemis axillaribus solitariis, v. terminalibus paniculato-congestis, bracteolatis, floribus breviter pedicellatis.
Endlicher in *Nov. Stirp. Mus. Vindob. Dec.* N. 47.	Roxb. Corom. III. t. 207. Nees, jun. Pl. Off. t. 355. Libanus Colebr. As. Res. IX. 377 c. Ic.

to know whether this is identical with what is known both here and on the Continent, as African or Arabian Olibanum.

I cannot conclude without adverting to the many interesting points which are connected with the identification of these ancient objects of commerce. Some of these we find produced in arid and apparently inaccessible countries, which thus, though unfit for the arts of culture, were yet attractive to commerce from producing substances valued by all the earliest civilized nations of antiquity. This was the case with the Myrrh and the Frankincense of the arid and desolate country which extends from the shores of the Red Sea to the Mountains of Abyssinia. By their means, therefore, we are able to trace the routes of ancient commerce and the limits to which it extended. In doing so, we cannot but be surprised that we are only now identifying some of these early-famed products of nature. This is owing partly to the want of curiosity in travellers, and partly to their want of knowledge; but in this respect the older books of travels contain more information than most of those of modern times. The ancients, we find on investigation, had more correct information respecting the sources of some of these substances than is generally supposed, or admitted into ordinary accounts. Thus, though Theophrastus mentions that part of Arabia which is about Saba, Adramata, and Citibæna, and Strabo says that it is in the happy region of the Sabæans that both Myrrh and Frankincense are produced—yet Arrian especially mentions λιβανος as procured with Myrrh at places on the coast of Africa, which probably correspond with the modern Tajoura, Zeyla, and Berbera. So Cosmas, usually called *Indicopleuestes*, as quoted in the volume on Nubia and Abyssinia (p. 117, in the *Edin. Cab. Library*), says, "the land of frankincense lies at the farthest end of Ethiopia, fifty days' journey from Axum, at no great distance from the ocean, though it does not touch it. The inhabitants of the neighbouring Barbaria, or the country of Sasu, fetch from thence frankincense and other costly spices, which they transport by water to Arabia Felix and India. This country of Sasu is very rich in gold mines." The account might be adduced as a correct one even of the modern commerce.

If we investigate such questions in a scientific point of view, we perceive how frequently species of the same genus of plants secrete similar products. We also perceive that which are sometimes adduced as exceptions to the law of the products of plants corresponding with their structure, may not always prove to be so upon extended investigation. We may hope, also, as in this case, that such investigations may sometimes lead to the extinction of genera of plants which have been so multiplied as to overload the science by the very efforts made for its improvement †. At all events, every fact so ascertained assists in removing the opprobrium which attaches to the history of so many articles of materia medica, as well as of commerce, that we know not whence they are procured, or how they are prepared.

Since this paper was read, and indeed since it has been in type, I find I have been anticipated in referring the genus Plösslea to Boswellia, as on receiving my copy of *Walpers' Repert. Botan. Syst.*, vol. v., and on referring for the account of the new species of Elaphrium, I found on the same page (419) the following, under the head of

"BOSWELLIA, *Roxb.*

"B. (*Amyris. Delile. in Cailliaud Voy. à Meroe Bot.* 99 ? *Walpers' Repert.* 560 ?) Papyrifera *Hochstett* Flora (B.Z.) xxvi. 91. Arbor cortice papyraceo; foliis pinnatis 7-8 jugis, foliolis sessilibus lanceolatis crenatis cum petiolo communi tomentoso pubescentibus; paniculæ ramis racemosis, capsulis clavatis.—Cortex in lamellas latissimas papyraceas secedit, etiam rami floriferi et foliiferi usque ad extremitates, uti resinam suaveolentem thuream exsudant, cortice papyraceo induti sunt. Semina basi et apice cuspidata, subtrigona, dorso lacunoso-gibbosa, ad marginem alæ membranaceæ laceræ fragmentis evidenter cincta quandoque hic margo obsoletus, sæpe tamen latus et valdè conspicuus est præsertim versùs basim seminis. —*Plösslea floribunda*, Endlicher, *Nov. Stirp., decad.* 47, *Iconogr.* t. 119, 120 crescit in Abyssiniâ."

This description, the papery bark and the frankincense-like exudation, will satisfy every one of the similarity of this plant to that described by Kempthorne and Malcolmson, and of the correctness of referring the above remarkable plant to Boswellia, and of the probability of the plant of Delile being the same as that described by Endlicher, which has thus probably a wide distribution.

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† I may take this opportunity of adducing another instance of the unnecessary extension of genera in the case of another medicinal plant, that is, the *Dorema Ammoniacum*, described and named by the late Professor Don, and confirmed by Dr. Lindley. Mr. Don's specimens were obtained at Jezud Khast, or Yezd Khast of others—as Capt. Hart, Col. Wright, Major Willock, and Col. Johnson, the last of whom mentions it as occuring also at Majar, but all in places between Shiraz and Ispahan. The late enterprizing traveller and botanical collector, M. Aucher-Eloy, also obtained imperfect specimens between Shiraz and Ispahan (he died at the latter place), as at Yezdichast, and at Majar or Meier. It is not probable that two different plants were found yielding so remarkable a gum resin as Ammoniacum in the same localities; but I can see nothing in the description by Messrs. Jaubert and Spach of their *Diserneston gummiferum* which might not apply to Dorema Ammoniacum if described from imperfect specimens, and these were all the authors unfortunately had in their possession.

ABSTRACT OF THE FIRST OF TWO LECTURES ON CRYSTALLOGRAPHY.

BY C. BROOKE, ESQ., M.B., CANTAB.

As the subject of these lectures is the relation of geometrical forms, little more than an abstract can be given, without a copious representation, by diagrams, of the models by which the lecture was illustrated; which might not be considered suitable for a periodical publication.

A crystal may be defined to be a solid body bounded by plane surfaces, provided the form is either normal, or the spontaneous result of any chemical or physical change. A crystal commonly exhibits a tendency to separate, when broken, in the direction of planes which are either parallel to some of the bounding surfaces, or inclined at a given angle to them. This tendency to split in certain directions, appears to point out that crystallization is the result of an aggregation of the particles or *molecules*, as they are commonly called, which is definite as regards the direction of each molecule; and further, that the forces by which these are held together, are unequal in different directions.

A comparison of crystalline forms appears to have been wholly unknown to the ancients. Linnæus was the first who bestowed any particular attention on the subject: his notions were, however, very crude, and bore some remote analogy to his views respecting the arrangement of the vegetable kingdom.

To Romé de l'Isle the title of founder of this science is more justly due, as he was the first to group together the crystals belonging to each known mineral species, and to refer them to some simple form. Passing over the labours of Werner, Brochant, Bergman, and others, Haüy must not remain unnoticed, in whose hands Crystallography for the first time assumed the character of a regular science. His theory is based upon the hypothesis that all the crystalline forms existing in any given mineral species are related to some simple form, which may be regarded as the general type of the species. This simple or *primitive* form he conceives to be that which may be obtained by cleavage, and to be the nucleus on which the crystal is formed by successive depositions of layers of molecules. As, however, in some crystals cleavage does not exist in these different directions, and in others, in more than these, this theory is incapable of general application. It is, therefore, proposed to refer each existing figure to some simpler *primary* form, the term denoting simply its relative character to the *secondary* forms derivable from it.

More recently two systems of Crystallography have been produced in Germany, by Weiss and Mohs; for any information on the ponderous nomenclature and notation of these systems, our readers are referred to the original treatises, or to Hardinger's work on Mineralogy, published in this country.

The system of classification of crystalline forms, which it is here proposed to adopt, is a modification of that first proposed by Bournon. This system was first presented in a complete form in the *Familiar Introduction to Crystallography*, and has since been further simplified in the *Encyclopædia Metropolitana*, Art. CRYSTALLOGRAPHY.

The system lately introduced by Professor Miller, in his elaborate and concise treatise, is, it must be admitted, more entirely abstract, and devoid of hypothesis than any other that has been proposed, inasmuch as he assumes nothing more than that which is actually found in nature; namely, that there is a constant relation between the faces of all crystals belonging to the same species. The work is, however, inaccessible to those who are not familiar with the elements of pure mathematics.

A crystal, as has been before observed, is supposed to result from the successive deposition of layers of molecules, on the forms of which much needless hypothesis has been bestowed. It is evident that the particles of a solid cannot be in contact, as we know no limit to the condensation or diminution of the bulk of the solid by cold. The view of the constitution of matter, which his important discoveries suggested to the comprehensive mind of Newton, was that the distance between the particles of matter is very great compared with the size of the particles themselves; and it may, in fact, be fairly questioned whether our idea of a particle of matter, derived only from a knowledge of the existence of those attractive and repulsive forces, on which the qualities of matter depend, is not necessarily independent of size and form.

The angles at which the edges of the planes, or faces of a crystal meet, are called *plane angles;* and the point formed by the union of three or more of these, a *solid angle.*

If the successive layers of molecules deposited on a crystal are deficient by successive rows in any regular order, a *decrement* is said to take place. This decrement is measured by the edges of the *defect* or part wanting to complete the simple or primary form; and the relation which these edges bear to the corresponding edges of the primary form is called the *law* of the decrement. This is invariably found to be a simple numerical ratio, rarely exceeding the number six. The planes resulting from these decrements are called secondary planes, and the forms bounded by secondary planes are secondary forms.

The law of symmetry requires that a decrement affecting any edge or angle of a crystal should similarly affect all similar edges or angles; and on the degree of symmetry that is observed to exist, the classification of forms depends.

To this law of symmetry there are, however, some few remarkable exceptions, as is the case of the tourmaline and other pyro-electric minerals.

The primary forms it is now proposed to adopt are six in number, and to one or other of these every observed crystalline form may be referred. These six primary forms it may be remarked correspond to the six systems adopted by Mohs and Miller. These are—the cube, the square prism, the right rhombic prism, the oblique rhombic prism, the doubly oblique prism, and the rhomboid.

The cube is a figure bounded by six equal squares, its edges consequently are all equal, and its angles all right angles. The general character of all crystals derivable from this form is that they present a similar aspect when viewed in their different directions, each of which is perpendicular to the plane passing through the other two.

In all the varieties of prisms, the crystals are supposed to rest on one of the bases or *terminal* planes of the prism, the surfaces which bound the prism lengthwise being called *lateral* planes. The edges at which these meet are lateral edges, and the edges at which they meet the terminal planes are terminal edges.

The square prism differs from the cube only in having its lateral edges either longer or shorter than the terminal. The law of symmetry does not, therefore, require that the lateral and terminal edges should be similarly modified; and the aspect of a crystal belonging to this class is that of a square similarly modified at its four corners, if it be viewed in the direction of its *axis*, a line drawn to the centres of its terminal planes, but not when seen in the direction of a line perpendicular to its lateral planes.

The right rhombic prism is a right prism whose base is a rhomb. The aspect of a crystal of this form, when viewed in the direction of its axis, is that of a rhomb similarly modified at its opposite angles.

The oblique rhombic prism differs from the preceding in being oblique in the direction of one of the diagonals of the base: the character that distinguishes this form from the right rhombic prism is, that when viewed in the direction of its axis, two only of the opposite angles are similarly modified.

All other prismatic crystals which do not possess any of the degrees of symmetry that characterize the other prisms, are comprehended in the class of doubly oblique prisms.

The Rhomboid, or Rhombohedron as it is called by some authors, is a figure contained within six equal rhombs: two only of its solid angles are formed by the union of three equal plane angles, these are called the terminal solid angles, and the other six, which are similar to one another, are lateral solid angles. The character of crystals of this class is that of symmetry in three or six directions when viewed in the direction of the axis, a line passing through the terminal solid angles. This form would result from elongating or compressing the cube in the direction of a line passing through two of its opposite solid angles; in the former case an *acute*, in the latter an *obtuse* rhomboid would result.

For a description and tables of the modifications by which these different primary forms may respectively be effected, our readers are referred to Art. CRYSTALLOGRAPHY in the *Encyclopædia Metropolitana.*

FIFTH ANNIVERSARY
OF
THE PHARMACEUTICAL SOCIETY,

Held at 17, *Bloomsbury Square, May* 19*th*, 1846.

MR. JOHN SAVORY, President, in the Chair.

THE Chairman said he had much pleasure in meeting the Members of the PHARMACEUTICAL SOCIETY at this their Fifth Anniversary.

It would be the duty of the Council on this occasion to present a Report of their Proceedings during the past year, from which the Members would be able to form some opinion of the present position and the prospects of the Society. It had been the desire of the Council to fulfil to the utmost of their ability the trust which had been committed to them, and he hoped that the Members present would freely express their opinions on the different subjects adverted to in the Report. Some of these subjects required their very serious consideration, as the satisfactory settlement of them was of the highest importance to the prosperity of that institution, and to the general interests of the body of Chemists and Druggists. He hoped that any discussion that might arise would be conducted temperately, and with that amicable spirit which had always characterised their proceedings on former occasions.

He called on the Secretary to read

THE REPORT.

THE Council have now to present the Fifth Annual Report, which they trust will be found satisfactory to the Members at

large, and prove that the objects for which the Society was established have been progressively and effectually carried out.

FINANCIAL REPORT.

Receipts and Expenditure from Jan. 1st to Dec. 31st, 1845.

Dr.

				£	s.	d.
Balance from Secretary				1	0	0
Interest—Life Members' Fund				17	11	11
Interest—Benevolent Fund	58	15	9			
Donations	98	19	0			
				157	14	9
Interest on Druggists' Old Fund				14	14	1
" General Fund				149	17	6
Sale of £2500 Stock				2478	15	0
" Journals				27	1	3
Lecture Fees				119	14	0
374 Town Members				589	1	0
1250 Country Members				1344	0	0
1288 Associates				676	4	0
166 Apprentices				87	3	0
Entrance Fees				126	0	0
Registration Fees				25	12	0
Subscriptions 1844				36	15	0
				£5851	3	6

Cr.

	£	s.	d.
Balance due to Treasurer, December 31st, 1844	681	9	2
Investment—Life Members	100	3	6
Investment—Benevolent Fund	152	9	7
Investment—Druggists' Old Fund	23	19	8
Furniture	36	4	8
Museum	131	0	8
Postage	36	13	1
Delivering Journals	101	11	3
Rent, Rates, and Taxes	346	19	4
Stationery	18	14	3
Advertisements	60	17	0
Salaries	267	10	0
Wages	131	19	0
Journals	900	0	0
Printing	59	17	0
Commission	52	7	9
Law Costs	109	12	10
House Expenses	64	18	6
Sundries	23	16	1
Lectures	782	11	7
Laboratory	1163	9	4
Library	59	8	6
Fixtures	171	2	6
Apparatus	49	13	10
Travelling Expenses	38	3	3
Repayments	2	12	6
Balance in Treasurer's hands	283	18	8
	£5851	3	6

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct, agreeably with the foregoing Statement, and that there was standing in the names of the Trustees of the Society, at the Bank of England, on the 31st December, 1845,

		£	s.	d.
On Account of the General Fund	3½ per Cents. reduced	3000	0	0
Benevolent Fund	3 per Cent. Consols	2094	18	7
Druggists' Old Fund	New 3½ per Cents	954	19	7
Life Members Fund	3 per Cent. Consols	652	15	3

John Wyman.
William Hooper.
Benjamin B. Orridge.
George S. Pedler.

April 9*th*, 1846.

Although the reduction in the subscriptions has not occasioned that increase in the number of Members and Associates, which the advocates of that measure so confidently anticipated, or led even to an approximation to the amount of revenue under the old system, yet the income received during the last year has been sufficient for the current expenses. The Council, however, have found it necessary to invest a portion of the funded capital in Buildings and Apparatus required for efficiently carrying out the Educational objects of the Society, which will account for the apparent excess of expenditure over the income.

An increase has taken place in the number of the Members, which is greater than it has ever been since the establishment of the Society. There is, however, a considerable falling off in the list of Associates, which may be partly accounted for by the fact that many of the Associates, having established themselves in business on their own account, have become Members, while the number admitted by examination has not been nearly sufficient to supply this deficiency. Others, however, have been removed by death, change of business, resignation, and other causes; and if we may judge from past experience, there is great reason to fear that under the voluntary system, the number of young men admitted by examination will not be sufficient to replace such deficiencies.

The Council report with great satisfaction the progress made in the Laboratory, the enlargement of which and its excellent arrangements having caused an immediate influx of Students. Twenty-six have joined the class during the present session, and several of them who have presented themselves for examination have given abundant proof to the Examiners that their time has not been spent in vain, and that the Society has within its walls every facility for giving a sound Chemical and Pharmaceutical Education to its Pupils—such an Education, in fact, as will fit them for the satisfactory practice of their profession, and entitle them to the confidence of the public.

The Council have again to regret that the valuable and costly lectures delivered in the Institution, have not been more numerously attended, and invite the serious attention of Members to the cause of this limited attendance, which appears also to prevail in such provincial schools as have been established, although, in all instances, the fees required for admission have been nearly nominal.

The Library and Museum have received but few additions; but several of those received are of great interest, and the chemical products resulting from the labours of our own pupils will be viewed with great satisfaction by all who take an interest in the well doing of this Institution.

The result of the reduction of the amount of subscription will not enable the Council to appropriate any part of the revenue to the augmentation of the Benevolent Fund, some voluntary addition to which they have pleasure in recording, and trust that some means will be adopted for better carrying out this object.

Your Council are unanimously of opinion that, in order to ensure the safety of the public, and to raise the character of our body in the manner contemplated in the formation of the Society, all persons practising Pharmacy should be obliged by law to receive a proper education, involving attendance on lectures and practical manipulation, and that their knowledge should be tested by examination. As these objects cannot be fully carried out on the voluntary principle, the Council have devoted much attention to the subject, and have prepared for the consideration of the legislature the draft of an Act providing for the Establishment of a College of Pharmacy, under the direction of the trade at large, unconnected with the educational and protectional objects of this Society—objects which would necessarily prevent such powers being granted to us by Parliament, however desirable it might be for us to possess them. The so-formed College would be vested solely with the power of examining Candidates and granting Certificates, and by such examination would offer to the public that protection which exists in every other country in Europe against unqualified persons.

The draft of a Bill is submitted for your consideration before active steps are taken respecting it.

It was thought desirable, however, to ascertain the sentiments of the medical bodies on the subject, and accordingly copies of the proposed Bill have been submitted to the College of Physicians, the Society of Apothecaries, and the National Association of General Practitioners. No official reply has yet been received from any of these bodies; but the Council have reason to believe, from conversation with individual Members of the profession, that the general principles of the Bill are likely to meet with a favourable reception, although some of the details will probably require reconsideration.

The College of Physicians has appointed Wednesday afternoon, at four o'clock, to receive a deputation of the Society, when the subject will be officially discussed.

MR. HUMPAGE rose to move "That the Report now read be adopted, and be printed in the Transactions of the Society." He felt, however, that were he simply to propose this motion without further comment, he should not be doing justice to the Council from which the Report emanated, and he believed that every one present would acknowledge that they were under great obligations to the gentlemen who had devoted so much of their time to the service of the body which they represented. A comparison of the position of the Chemists and Druggists of this country now, and that which they held six years ago, must satisfy every one that much good had resulted from the labours of the Pharmaceutical Society. There was, in the Report which had just been read, matter both for satisfaction and for regret. It was gratifying to find that an increase had taken place in their Members, and that the number of these was greater now than it had ever before been since the establishment of the Society. On the other hand, it appeared that there was a considerable falling off among the Associates, and this he must say he was utterly at a loss to account for. What was the cause of it? Was it that the young men among them considered that the position which the Members and Associates of the Pharmaceutical Society were endeavouring to take was too high and scientific for them? Was it that they were satisfied with the condition of ignorance, and incompetence for the duties they were called upon to perform, which at present characterised so large a proportion of them, and that they preferred this ignorance to the means of education and qualification which this Society was offering them? In what other way could they account for the secession of their Associates, who were the very persons to whom the Society was calculated to be of the greatest service, and who stood the most in need of this assistance? He, in common, he believed, with many of those around him, had daily cause to regret the want which existed, at the time of their pupilage, of efficient means of education for Chemists and Druggists. Yet now that these means were offered, it appeared from the small number who attended the valuable and costly lectures of this Society, that they were but inadequately appreciated. This was the unfavourable view of the present position of the Society. It was gratifying to find, however, that this discreditable apathy was not universal. He was glad to learn that the laboratory of the Society had been well attended. This was a part of their operations which was calculated to be of very great utility. In passing through the country, he had met with some of those who had availed themselves of the means of education which the Society offered, and he could speak from personal observation of the marked superiority which these possessed over their less aspiring brethren.

Mr. Palk, of Exeter, in seconding the motion, said he thought the Society was progressing in a way that would prove satisfactory to the general body of subscribers. The principal feature which the Society presented, consisted in the means afforded for improving the qualification of the Members and Associates. The establishment of that Institution, not only proved a bond of union among them, but it opened a channel for the communication of knowledge, and for the exercise of a moral influence which they did not previously possess. He believed that in reference to these several objects, the Institution was becoming more and more efficient. He had marked the progress of the institution, having visited it at different periods since its formation, and he had observed a very satisfactory advancement up to the present time. He hoped the Council would persevere in the course they had hitherto pursued. There were, no doubt, many discouraging circumstances that would beset them, but he believed that these would all eventually be overcome, and that those who laboured so incessantly for the accomplishment of the objects desired, would reap the reward of their exertions.

The Resolution was then put and carried.

Mr. M'Culloch moved the next Resolution, "That the Thanks of this meeting be given to the Council and to the local Secretaries for their very effective services during the past year." The previous speakers had anticipated him in alluding to much of the labours for which they were indebted to the Council, but he could not avoid mentioning one subject to which no reference had yet been made, and which involved a debt of gratitude from the Members to the local Secretaries throughout the country, as well as to the Council in London.

He alluded to the energetic exertions which had been made in petitioning the legislature, and otherwise opposing the objectionable clauses which had been introduced into Sir James Graham's Medical Bill, and which clauses, if passed into a law, would have seriously affected the interests of the Chemists and Druggists. The fear of such legislative interference, was now, happily, for the present removed; but their thanks were due to those who had contributed in relieving them from the danger with which they had been threatened.

Mr. **Ward** had much pleasure in seconding this motion. The Council had been engaged in promoting education among the Members of their body, and he was glad to find they considered that this education should be progressive,—that it was not sufficient for a young man merely to serve an apprenticeship, but that he must keep pace with the requirements of the age, and carry to a higher point than had hitherto been generally attained by them, the scientific knowledge of the several subjects involved in their occupations as Chemists and Druggists. The Council had already accomplished much, and the Chemists were assuming a position which would enable them to accomplish a great deal more, for it was necessary that their Members should be properly educated and qualified before they could consistently ask for legislative protection. It was certainly a source of much regret to find that so much indifference should exist on the part of the Assistants and Apprentices with reference to the facilities for education which were afforded by the Society; this state of things presented the strongest possible evidence of the necessity for an Act of Parliament which should render education and qualification compulsory in those who are engaged in the preparation of medicines. He was indeed surprised that the legislature had so long allowed the existing state of things, with reference to the practice of Pharmacy, to continue, and he hoped that before long an important change would be effected.

The Resolution was put and carried.

Mr. **Thomas Herring**, on behalf of the Council, acknowledged the Vote of Thanks. He was glad to find their proceedings had met the approbation of their constituents, and he trusted the approval which had been expressed would prove a stimulus to them for increased exertions. It was very certain that, as a body, they were assuming a much higher position than they occupied a few years ago. The ignorance which existed when he entered the business about thirty years ago, and which attached to those in the wholesale as well as the retail, would no longer be tolerated. The Council were trying to effect all that they could in the promotion of education and the improvement of the general character of the body of Chemists and Druggists, and he thought they had already done much. He might allude to the interview they were about to have with the College of Physicians as affording an indication of the favourable opinion entertained in high quarters of their proceedings. It was matter of much regret to him that so little had yet been done towards increasing the *Benevolent Fund.* He would again propose, what he had suggested last year, that they should have a dinner, and endeavour to promote special subscriptions towards this object by a festive and convivial meeting.

Mr. **Tosswill** was authorized, on behalf of a Member of the Society, to offer £20 towards the *Benevolent Fund*, if twenty-five other subscribers for the same amount could be found.

DRAFT OF AN ACT OF PARLIAMENT.

Mr. Morson said he had been requested by the Council to bring before the notice of the Meeting the draft of a Bill which the Council had prepared "for regulating the Business of Chemists and Druggists, and for establishing a College of Pharmacy." He would read and explain such parts of the Bill as would enable them to understand its general purport, and the Members present would then be enabled to express their opinions upon it. The preamble of the Bill represented that

"It is expedient that persons exercising the business or calling of Chemists, or Chemists and Druggists, in England and Wales, should possess a competent knowledge of Pharmaceutical and Practical Chemistry; and that they should also be acquainted with the language in which medical prescriptions, orders, or receipts, are generally written, and with other branches of useful learning; and that all persons before exercising the said business or calling should be duly examined as to their skill and knowledge by learned and competent persons; and that a register should be kept of all persons engaged in the said business, and that such other provisions should be made for the benefit and protection of such persons as are hereinafter contained."

It was therefore proposed that a College should be founded, to be called *The College of Pharmacy of England*, which would be established on the most broad and liberal principles. In the first place the Secretary of State would appoint a provisional Council, consisting of five or more Chemists and Druggists, for carrying the Act into operation; and this Council would appoint a provisional Registrar. Then,

"Every person who shall within one year after the passing of this Act, present or cause to be presented to the said provisional Registrar, a certificate signed by two of her Majesty's Justices of the Peace, stating that such person did at the time of the granting of such certificate exercise the business or calling of a Chemist, or Chemist and Druggist, in some part of England or Wales, or a certificate from the Council of the Pharmaceutical Society of Great Britain, stating that such person was at the time of the granting of such certificate a Member of such Society, shall be entitled to be registered, and the said provisional Registrar is hereby required to cause the name of every such person to be registered in a book to be provided by the said provisional Council for that purpose as a Pharmaceutical Chemist and Druggist, and that all persons so registered shall become Members of the said College of Pharmacy."

It was proposed that a fee of one guinea should be paid on registration, except in the case of Members of the Pharmaceutical Society, who would be exempt from the payment of any fee. A period of twelve months would be allowed for effecting this registration, and at the end of this time the list of the persons registered under the Act would be published, and the constituency thus formed would be called upon to elect from among themselves a Council consisting of twenty-one Members, who would be the Council of the College of Pharmacy, and would succeed the provisional Council previously appointed. One-third part of this Council would go out of office every year, and there would therefore be a yearly election of one-third part of the Council by the Members of the College. The Council thus elected would appoint a *Board of Examiners* in classical knowledge, Botany, Materia Medica, Pharmaceutical and general Chemistry and Toxicology; and no person after this period would be entitled to be registered as a

Pharmaceutical Chemist and Druggist, or to be admitted a Member of the College of Pharmacy, unless he produced a certificate of competent skill and knowledge, and qualification to exercise the business or calling of a Pharmaceutical Chemist and Druggist from such Board of Examiners. It would thus, necessarily, be twelve months after the passing of the Act before the Examinations would come into operation, and after this time no person, unless he shall have been registered as a Pharmaceutical Chemist and Druggist, and admitted a Member of the College of Pharmacy, or unless he shall have been in business as a Chemist and Druggist before the passing of the Act, would be allowed to prepare, compound, or dispense, for sale or gain, any medicines or medicinal substances. The penalty for infringing the Act was proposed to be a fine, not exceeding ten pounds, or imprisonment. Physicians, Apothecaries, and other legally qualified Medical Men were, of course, exempted from the operation of the Act. It would thus be seen, that the proposed College of Pharmacy would comprehend the whole of the Chemists and Druggists throughout the country, so that no objection could be raised to the constitution of the College on the ground of exclusiveness. It might indeed, perhaps, be asked, why was it not proposed that the powers to be given to this College should be conferred upon the Pharmaceutical Society? This question had engaged the serious attention of the Council, and they had come to the conclusion that it would be impracticable to obtain an Act of Parliament that would confer upon the Pharmaceutical Society the powers of examination, and of granting certificates to practice Pharmacy, while they continued as they now are an educating body. All the authorities, both legal and parliamentary, whom they had consulted, agreed on this point. Experience, also, with reference to the establishment of similar institutions, tended to the same result. He might instance the case of the institution, formerly called the London University, in Gower Street. This institution was originally established with the view of obtaining an Act of Parliament authorizing them to institute examinations and grant degrees, as well as provide education. But this power was refused them, on the ground that the body who provided education ought not to be entrusted with the examination of their own pupils, and the granting of degrees which would entitle the possessors to honorary distinctions and privileges. The result was that the London University became a purely educational institution, under the name of University College, and a new and perfectly distinct body was formed, called the University of London, for the sole purpose of examination and the granting of degrees. With this experience before them, and the coinciding opinions of persons in whose judgment they placed confidence, it would, he thought, have been unwise in the Council to propose vesting the examination of the Chemists and Druggists in the Pharmaceutical Society as at present constituted. There was, therefore, but this alternative left them, either to make the Pharmaceutical Society what the proposed College of Pharmacy was designed to be, in which case its constitution would require to be entirely altered, the principal part of its objects relinquished, and the expensive provisions for carrying out an efficient system of education entirely sacrificed; or, on the other hand, to leave the Pharmaceutical Society in the position it has always hitherto occupied, and to establish a separate institution, to be called the College of Pharmacy, which would have no other object than that of providing for the examination, registration, and licensing of all persons engaged in business as Chemists and Druggists. The Council had decided in favour of the latter alternative. Under this arrangement, the two institutions would have different objects, and would be perfectly distinct and separate from each other;—the Pharmaceutical Society having for its objects the providing of an efficient system of education, suited to the wants of the Chemists and Druggists, the protection of its Members from legislative interference or legal oppression, the relief of their distressed brethren through the application of a Benevolent Fund, and the promotion of the science of Pharmacy by such means as are employed by other scientific institutions. These objects were more compatible with the constitution of a voluntary association than of an institution to which every Chemist and Druggist would be compelled to belong. On the other hand, it seemed more in accordance with the principles of justice that a law affecting every Chemist and Druggist in the country should be put in operation by a body representing all those whom it affected, and such would be the Council of the proposed College of Pharmacy. He believed the only objection that would be urged to this proposed measure by their Members, originated in a fear that the establishment of a College of Pharmacy would injuriously affect the interests of the Pharmaceutical Society. There was reason to believe, however, that the increased demand for education, which would be created by such a measure as that contemplated, and the stimulus which would be given to the cultivation of science among the body of Chemists and Druggists, would insure at least an equal, if not an increased, amount of support to a scientific and educational institution. The Council were anxious to obtain the free expression of opinion on these points from the Members, and with the view of eliciting a discussion on the subject, he would move, "That this meeting approves of the proposal to establish a College of Pharmacy under the sanction and authority of an Act of Parliament, for the registration of all existing Chemists and Druggists in England and Wales, and for the examination of those persons who may for the future desire to enter into business as such."

Mr. Tosswill seconded the motion.

Mr. Edwards, of Dartford, thought that as Members of the Pharmaceutical Society, they ought to pause before agreeing to the adoption of the measure which had just been submitted to them. He viewed with considerable alarm the proposition to establish a College of Pharmacy, independent of the Pharmaceutical Society, because it appeared to him that the tendency of such a measure would be to reduce that Society to a condition of comparative insignificance. He should greatly regret this result after six years of labour, and the expenditure of many thousands of pounds. He was by no means satisfied of the necessity of resorting to the proposed method of carrying out the objects contemplated. Had they not examples before them, in the instances of the Universities of Oxford and Cambridge, of bodies combining the offices of education and of examination? The case of the London University had been adduced in support of the view taken by the Council, but he thought the cases were not parallel, inasmuch as the London University sought the power of granting degrees which would confer honorary distinction and privileges, while we should require no such power. The Members of the Pharmaceutical Society had a right to expect that the examination of Chemists and Druggists should be vested in their hands if possible. Deprive them of this office and the Society would sink to the condition of a mere school or scientific club. The advantages of the School would be confined to London, and what inducements would there be for Country Members to continue their subscriptions to the Society. It was stated in the Report, that under the voluntary system the Society could not maintain its numbers, yet it was proposed to retain it still as a voluntary association, and with this disadvantage as compared with its present position, that every Chemist and Druggist would be obliged to belong to the College of Pharmacy, and he thought most of them would be satisfied with that distinction. He was by no means convinced that under the proposed measure the Council would find their School so successful as they seemed to anticipate. They could not expect to keep the education all to themselves; other schools had already started, and some of these had such an array of distinguished patrons, as must give them a great advantage over their competitors. Would they not, therefore, be risking the very existence of the Society, by placing it in so precarious a situation. He was satisfied the course recommended to be pursued was unnecessary, and that all that was proposed to be given to the College of Pharmacy might be enjoyed by the Pharmaceutical Society, and this body continue the representative of the Chemists and Druggists. He then proceeded to point out some of the details of the proposed Bill which he thought were objectionable, and concluded by hoping that more mature consideration would be given to it before they committed themselves to its recommendation.

Mr. Tosswill was sure that the Council would feel much indebted to Mr. Edwards for the fair and able manner in which he had stated the objections—he believed the principal objections—that could be urged against the proposed Bill. The Council were anxious to have the subject well weighed and freely discussed before taking any active steps with reference to it. No difference of opinion appeared to exist in regard to the necessity of instituting an examination of Chemists and Druggists—the only question was as to the best method of carrying this object into effect. Mr. Edwards thought that the power of enforcing registration and examination might be exercised by the Pharmaceutical Society, in connection with its other objects as an educating body. All that he, Mr. Tosswill, could say in answer to this was, that however anxious he might be to add to the stability and influence of the Pharmaceutical Society, yet he could see no prospect of their being able to obtain this addition to their power. The opinions of all those practically conversant with such subjects, whom they had consulted, tended to confirm the Council in this view; all agreed in stating that we should have no hope of inducing the legislature to confer this power upon the Pharmaceutical Society, as at present constituted. They had an instance before them, to which allusion had already been made, in the case of the London University, from which they could judge of the principles that were now recognised in legislating on these subjects. He could not admit the correctness of the distinction which Mr. Edwards had endeavoured to point out between the granting of degrees by University College, and the licensing of Chemists and Druggists by the Pharmaceutical Society; he thought the substantial advantage resulting in the latter case, where the possessor of the licence acquired the power, which he could not otherwise have, of carrying on his business, was quite as great as that conferred by the possession of an University degree. The practice of the legislature was, therefore, opposed to the granting to the same body the power of educating, and of examining, candidates for degrees, licences, or diplomas. The examples referred to in the Universities of Oxford and Cambridge proved only that different principles were acted upon centuries ago when those institutions were established. The principles recognised in the present day were of a more liberal character. It must be borne in mind that they were not proposing to legislate merely for the Pharmaceutical Society, but for the whole body of Chemists and Druggists throughout the country; and he thought the most satisfactory way of carrying such legislation into effect, was to establish a College as suggested, on liberal representative principles, giving to every Chemist and Druggist a vote in the election of the governing body. There were some of Mr. Edwards's remarks, respecting the details of the Bill, with which he concurred, and he had no doubt that the Council would maturely consider the objections which had been urged, with the view of making the Bill as complete and satisfactory as possible.

Mr. **Jacob Bell** was anxious to make a few remarks on the very important subject then before the meeting. He had heard the observations made by Mr. Edwards with reference to the proposed Bill with much satisfaction, having himself gone through the same reasoning, and long entertained very similar views. So strongly, indeed, was he impressed with the desire to make the Pharmaceutical Society the examining body, that he had drawn out a Bill, having that object, which he had intended submitting for adoption; but on conferring with Members of Parliament and other practical men on the subject, he found there was no chance of carrying such a measure. It was, therefore, from necessity that he had given his support to the Bill then under consideration. It was the only measure yet proposed that seemed to offer a rational prospect of their being enabled to carry it through Parliament. It must not, however, be supposed, that the Council submitted this Bill to the Members as a perfect measure; they wished it rather to be viewed as a rough draft, which would admit of much improvement. They were glad to receive any suggestions on the subject, and probably might yet be enabled so to modify the Bill as to meet the views of all. The Council were desirous of obtaining the opinions not only of their own Members, but also of those medical bodies who were likely to take an interest in the subject. It was with this view they had applied for an interview with the College of Physicians, and it was possible that something might occur at that interview to induce them to modify the proposed measure.

Mr. **Farmar** was glad to hear the statement just made by Mr. Bell. He certainly had been taken by surprise in finding a Bill proposed, the effect of which he thought would be, to a certain extent, to supersede the necessity for the Pharmaceutical Society. He was aware the Council had a very difficult task to perform in framing a Bill tha would meet the views of all parties, and was quite disposed to believe that they were anxious to fulfil their duty to their constituents as well as to the trade at large. He should be glad to know what the operation of this Bill would be with reference to the Associates of the Pharmaceutical Society—would they be obliged to pass the examination in order to be admitted Members of the proposed College? He doubted the propriety of restricting the sale of compounded medicines, such as tincture of rhubarb, to registered Chemists and Druggists, and thought it would be quite sufficient for the restriction to extend to the dispensing of the prescriptions of medical men. In conclusion, he recommended that the Bill should be published in the Journal, that the members of the trade might have an opportunity of fully considering it, and afterwards that a general meeting of Chemists and Druggists should be convened to discuss it in detail.

Mr. Bell, in reply to Mr. Farmar's question as to the operation of the proposed Bill in regard to the Associates of the Pharmaceutical Society, observed, that a clause was introduced by which the Council of the College of Pharmacy would be empowered to mitigate or suspend the examination in such cases. He had found from some communications he had received from the country, that many of the Country Druggists entertained a very different opinion from that expressed by Mr. Farmar with reference to the sale of medicines by unregistered persons, and that they objected to the clause relating to that subject as not being sufficiently restrictive. He, Mr. Bell, was disposed to believe that the Council had taken the right course in steering midway between the two extremes. It would no doubt be desirable, as Mr. Farmar had suggested, to publish the Bill, and to endeavour to get the opinions of the members of the trade with reference to it, but it would be useless to do this until the Council had ascertained what kind of a Bill they were likely to be able to carry.

Mr. Burnedge thought the proposed restriction in regard to the sale of such medicines as tincture of rhubarb, would be opposed by the public in small places, where the population was not sufficient to support a regular Druggist.

Mr. Ward approved of the principles upon which the proposed Bill was founded, and thought the Council had acted wisely in adopting a liberal policy. The Pharmaceutical Society might be considered as having a twofold object, one relating to the advancement of the immediate interests of the Members of the Society, the other involving the promotion of the general good of the body of Chemists and Druggists throughout the country. In the adoption of a measure such as that under consideration, he thought the broader the foundation was made, the more solid and substantial would the superstructure be. Some modification might perhaps be necessary in some of the clauses, and the more these were discussed the better, but he felt more than ever convinced of the necessity for legislation, and trusted the time was not far distant when they should have a College of Pharmacy established under the authority of an Act of Parliament.

Mr. Pedler thought that before any active steps were taken by the Council in reference to this Bill, a General Meeting of Chemists and Druggists should have been called, so as to obtain the opinion of the trade on the subject before making application to other medical bodies. There were some of the details of the Bill, which he thought, required much consideration.

Mr. Morson said that many of the remarks which had been made in the course of the discussion would be received by the Council with every disposition to meet the views of the majority. It must not be forgotten, however, that an Act of Parliament should have for its object the promotion of the interests, not of any class or body, but of the public at large. The spirit of the age was opposed to class legislation, or the granting of exclusive rights or privileges, excepting in as far as these were required for the benefit of the community. It was admitted on all hands that it was desirable to have an Act of Parliament for regulating the practice of Pharmacy in this country, and that it was equally important to provide for the education of those engaged as Pharmaceutists. The Pharmaceutical Society was identified with the office of education, and had hitherto successfully conducted its labours in this department. He did not agree with a previous speaker, Mr. Edwards, that there was any reason to fear the effects of competition with our School. Such competition would do good by stimulating us to greater exertions. It was true that some of the Schools which had recently sprung up, made a parade of great names in their advertisements, but he was not deceived by great names in such cases, believing that they were of little or no service, unless backed by ample funds and resources. He was very glad to observe new institutions springing up for the cultivation of Chemical Science, but he believed that none of those hitherto established were likely to affect us, as the system of instruction conducted in them was not that best suited for the Chemist and Druggist.

The motion was then put and carried.

LIFE MEMBERS' SUBSCRIPTIONS.

Mr. Palk, of Exeter, then brought before the Meeting the subject of the subscriptions which had been paid by the Life Members of the Society. He stated that he had been commissioned by four of his brethren at Exeter to represent to the Meeting what they conceived to be the hardship of the position in which they were placed. He (Mr. Palk) was the first person at Exeter who paid the twenty guineas as his Life Subscription, and he did this in the belief that there was no probability of any reduction in the annual subscription. Under this impression, which had been confirmed by statements which had appeared in the *Pharmaceutical Journal*, he considered it an advantageous investment to compound an annual subscription of two guineas by the payment of twenty guineas in advance. He had also, on financial grounds, induced the other Life Members in Exeter to follow his example. The Council had more than once represented that the objects of the society could not be carried out with a lower amount of subscription than that originally paid, so that he, and those who acted under his recommendation, felt secure in the course they pursued. The Council subsequently made a reduction in the amount of subscription, which, for Country Members, was now One Guinea, instead of two, per annum. He thought, under these circumstances, that part of the sum which had been paid by the Life Members ought to be returned to them. Application had been made to the Council more than once to this effect, but they had negatived the application. He was commissioned now to bring the subject before the Members, in the hope that they would come to a different decision, which he thought was called for by every principle of justice as well as policy. He (Mr. Palk) in the present state of the case, felt himself in a very awkward position, having induced several of his brethren to invest what to them was a considerable sum of money on the faith of statements which proved to be fallacious. Some of these statements had appeared in the *Pharmaceutical Journal*, and yet no explanation had subsequently been given there to satisfy them of the justice of the course which had been pursued.

Mr. **Jacob Bell** was glad that Mr. Palk had brought this subject before a meeting of the Members of the Society, as it gave him an opportunity of stating why the matter had not been explained in the Journal. The fact was that he (Mr. Bell) had always been an advocate for the return of a proportion of the money to the Life Members, considering the case to be a simple rule of three sum—as two guineas to twenty guineas, so is one guinea to ten guineas. He felt that the Life Members had displayed the greatest confidence in the honour of the Council, and that they ought to participate in the general reduction which had taken place, otherwise they might complain of what appeared like a breach of faith. He (Mr. Bell) had on several occasions argued to this effect in the Council, but was always in the minority, and no order having been given for the publication of the Report, he had purposely abstained from alluding to it in the Journal.

Mr. **Herring** had no hesitation in stating that he was one of those in the Council who had opposed the return of any part of the Life Members' subscription. He thought they had no just claim for such return, and considered that it would be wholly at variance with the ordinary method of doing business. The Life Members had, even according to Mr. Palk's statement, paid their Life Subscriptions under the impression that it would be a good investment, and investments of this kind generally involved more or less of speculation, which in this case had not turned out quite so favourable as was expected.

Mr. **Waugh** thought Mr. Palk and his friends would do well to ask themselves the question, What would their conduct have been had it been found necessary to increase, instead of lowering, the amount of subscription? Suppose the annual subscription had been raised to three guineas a year, would the Life Members have been willing to pay ten guineas in addition to what they had already paid, or would they not rather, in such case, have represented that they purchased their Life Membership at the price agreed between both parties, and that they took it subject to all contingencies?

Mr. **Foulger** thought it would be very bad policy to return any part of the Life Members' subscriptions; he could see no ground on which the Life Members could justly claim it. If this application were conceded to, every Annual Subscriber, who for several years had paid a subscription of two guineas, would have an equal claim for the return of a part of such subscription, and the Society might be called upon to refund a larger sum than all their property amounted to.

Mr. **Morson**, Mr. **Tosswill**, and Mr. **Edwards** opposed the return of any part of the subscriptions.

The **Chairman** said there was no motion regularly before the Meeting. If it was desired that the sense of the Meeting should be taken on the subject, it would be necessary that some specific proposition should be moved and seconded.

The **Secretary** stated that the Life Members subscription was still fixed by the bye-laws at twenty guineas; that while this was the case, it would not be competent to the Council or the General Meeting to return any part of such subscription, and that the bye-law relating to the subject could not be altered without three months' notice being given.

The Meeting then proceeded to the election of Members of Council and Auditors for the ensuing year. As there were only a sufficient number of candidates proposed to supply the vacancies, the election was merely a formal one.

The following are the Members of Council who continue in office by Lot, agreeably with the provisions of the Charter:—

Cubitt, George, Upper Market, Norwich.
Edwards, Charles, 63, Great Russell Street.
Hallows, William Ayscough, 2, Clark's Place, Islington.
Ince, William, 31, Southampton Street, Strand.
Savory, John, 143, Bond Street.
Stamper, Ralph, 140, Leadenhall Street.
Tosswill, Charles Speare, 8, Torrington Place, Torrington Square.

The following Candidates were elected to fill the vacant places, as Members of the Council for the next year:—

Bartlett, William, 1, Brettin Terrace, Chelsea.
Bell, Jacob, 338, Oxford Street.
Cole, George, 29, Fleet Street.
Davies Samuel, Eastgate Street, Chester.
Garle, John, 12, Kensington Terrace, Gravel Pits.
Gifford, Joseph, 104, Strand.
Herring, Thomas, 40, Aldersgate Street.
Morson, Thomas, N.R., 19, Southampton Row.
Pigeon, Richard Hotham, 31, Throgmorton Street.
Stephens, Henry, 3, Tyne Street, North Shields.
Squire, Peter, 277, Oxford Street.
Terry, Stephen, 25, Milsom Street, Bath.
Ward, John, 79, Bishopsgate Street
Watts, John, 106, Edgware Road.

The following were elected the Auditors for the next year:—

Baiss, William Arnold, 125, Lower Thames Street.
Hooper, William, 21, Great Russell Street, Covent Garden.
Orridge, William, 22, Ludgate Hill.
Pedler, George S., 199, Fleet Street.
Wyman, John, Red Cross Street.

A vote of thanks was passed to the Chairman, which he acknowledged, and the Meeting, which was a numerous one, then separated.

DEPUTATION OF THE PHARMACEUTICAL SOCIETY TO THE COLLEGE OF PHYSICIANS.

On Wednesday, the 20th of May, the President and Censors of the Royal College of Physicians received a Deputation from the Pharmaceutical Society, to confer respecting the introduction of a legislative enactment for the regulation of Pharmacy in this country. The draft of the proposed Bill, prepared by the Council, had previously been sent to the College.

The President and Censors admitted the necessity of some regulations for the examination of Chemists and Druggists, and stated that the College would be disposed to consider seriously any definite proposition with reference to this object. The President stated that the present interview must not be considered an official meeting with the College, as the President and Censors were desirous of ascertaining more correctly the views of the Chemists before introducing the subject to their body at large.

The President suggested that the most important question to be considered was the constitution of the Board of Examiners. By whom was it intended that the Chemists should be examined?

The Deputation replied, that in the proposed Bill it was provided that a Board of Examiners should be appointed by a Council representing the body of Chemists and Druggists. At an interview which had taken place between a Committee of the College of Physicians and the representatives of the Chemists about five years ago, the appointment of a joint board had been suggested, consisting of Physicians and Chemists.

The President stated his opinion, that the College would be disposed to favour the appointment of a joint Board of Examiners, partly nominated by the College, and the remainder by the Chemists, the Deputation replied that they felt justified in stating, that such a proposition would be likely to be favourably received by their body, and that they would revise their plan for the purpose of introducing this modification.

The Deputation, on retiring, acknowledged gratefully the very courteous reception with which they had been favoured.

LIST OF MEMBERS, ASSOCIATES, AND APPRENTICES—(CONTINUED).

Elected in May.

MEMBERS.

BRAINTREE . . .	Jull, Thomas
BRENTFORD . . .	Wood, Henry
BRISTOL	Barge, John B., 7, St. Augustin's Parade
BUCKENHAM (NEW)	Turner, Edward H., Market Place
CAMBRIDGE . . .	Squires, Samuel, Peas Hill
COSHAM	Baker, Thomas Brown
DARLINGTON . .	Dixon, William, High Row
HALIFAX . . .	Garlick, Thomas Hey, Northbridge Street
HAMMERSMITH .	Westall, Richard W., King Street

LONDON	*Bucklee, William Henry, 86, Bond Street
	Main, William, Old Kent Road
	Pierson, Samuel S., 55, Brompton Row
NANTWICH	Blades, Holland, High Street
NORWICH	Hall, William, High Street
SLEAFORD	Heald, William, Market Place
SHIELDS (SOUTH)	Russell, Thomas, 5, East Holborn
SOUTHPORT	Kershaw, James, Neville Street
STAFFORD	Fowke, George, Market Square
THURSO	Bremner, William, High Street
ULEY	Osborne, Daniel, High Street
WATERFORD	Higgins, John, Saratoga County, New York
WITHAM	Green, Charles Owen, High Street
WOOLWICH	Atkins, Francis Thomas, Powis Street

MAJOR EXAMINATION.

Bancroft, John Jones	Mold

MINOR EXAMINATION.

Copney, William	37, Berners Street

REGISTERED APPRENTICES.

APPRENTICES.	RESIDING WITH	TOWN.
Bridge, Richard B.	Mr. Blandford	London
Carrick, John	Mr. Gilpin	Newcastle
Jackson, William	Mr. Clater	Retford
Lovett, John	Mr. Lovett	Gloucester
Morton, Thomas	Mr. Davidson.	Berwick
Quiller, Charles R.	Mr. Guy	Helston
Rhodes, Thomas B.	Mr. Gibson	Newcastle
Ritson Charles	Mr. Ritson	Sunderland
Sessions, Joseph	Mr. Knight	Cirencester
Ward, Joseph H.	Mr. Jones	London
Williams, Thomas J.	Farmer and Bird	Worcester

ORIGINAL AND EXTRACTED ARTICLES.

ON CHINESE PHARMACY.

THE drug shops of China are large, and are commodiously fitted up. They have a great array of drawers and jars, arranged much in the same way as in England; glass vessels are very rare. Different departments are allotted to separate classes of medicaments; care is taken to keep things in order; and there is a degree of neatness and method in their appearance which would not be discreditable to a London laboratory. They do not seek notice by party-coloured bottles and cabalistic signs, which make so great a figure in the windows of some English medicine vendors, but are rigorously plain, and, as far as mere appearance is concerned, appropriate.

On examining the contents of the drawers, boxes, &c., few things were observed identical with, or similar to, the medicinal substances employed in Europe. Camphor, rhubarb, and liquorice, were conspicuous among recognised articles; but our familiar friends in the shape of purging salts, calomel, tinctures, &c., were nowhere found. Even opium, of which so much is used as a luxury, does not appear to be admitted in the materia medica; at least it could not be traced in any form in the drug-shops. Cinnabar, or a substance much resembling it, is a favourite remedy in many external diseases, and it consequently is a prominent article in every collection.

On the Druggists' counters are ample boxes containing preparations for such purposes as these—to arrest cholera instantly, to communicate strength directly, to infuse courage, to excite love, and to confer the faculty of being loved, and so on, in proportion to the wants and wishes of individuals. This is sufficiently ridiculous, but is not more so in reality than the pretensions to similar efficacy constantly put forth in more enlightened places, and is probably much less mischievous. The Chinese panaceas, hero-making mixtures, philtres, and medicated charms, are believed to be generally harmless, which is more than can be predicated of many of the compounds so much vaunted and consumed in England under the names of antibilious, antidyspeptic, antinervous, *antiomnia mala* medicines.

For a small fee, not equal in value to a shilling, the Chinese physician, after examining the pulse, exhibiting great interest in the welfare of the patient, and profound knowledge of his case, writes a recipe, which, in imposing appearance, would put to shame the most elaborate performance of a London Professor. It occupies generally a large sheet of paper, is often diversified by red, added to the ordinary black characters, and is altogether a learned and laborious-looking composition. When carried to the Druggist, he spreads it on the counter, examines it attentively, and then proceeds to dispense *secundum artem*. Many ingredients, seldom less than nine or ten, make up the total of articles prescribed; they are almost always powders, sliced roots, or other dry substances, fluids being seldom sent from the apothecary's store. For each a separate piece of paper is laid out in regular array, some white, and others red; the former are the most numerous, and to them the most common simples are consigned, the crimson being reserved for those which are most powerful, or more highly esteemed, such as ginseng.

Surgeons dispense their own medicines, and local appliances, and do a little, what they can, in short, in way of medical prescription, to any who will apply for it. They hold nearly the place of the English general practitioner, but their shops are generally poorly furnished, and neither their employment nor profit is on a large scale.

The department of the Druggist is more lucrative than that of the Surgeon; for as the people are fond of physic, and they have no desire to balk the inclination, they not only give on every possible occasion, but give liberally. As an example of the latter disposition, it was observed that five balls, larger than marbles, to be taken at once, were prepared for some form of bowel complaint. It might be assumed that they did not possess very active ingredients; but how the patient, without the assistance of a probang, contrived to gorge them was the wonder. Men who should order or issue such perilous looking pellets in England, would be considered fit to deal with the diseases of horses only.

The Chinese Pharmacopœia, or rather Materia Medica, is a work of great magnitude; a brief epitome of it in the writer's possession extends to upwards of 1300 octavo pages.

Ginseng is the paramount promoter of health, and prolonger of life. It is said to possess astonishing power, not only of sustaining, but restoring the human frame, and is regarded with a degree of admiration bordering on religious adoration. No one's case need be considered desperate who can procure this, the *pabulum vitæ*, in abundance; but it is so costly, as to be beyond the reach of the great proportion of the afflicted. Generally it is, except in very small quantities, an article of sale by itself, the man who deals in it dealing in nothing else; and it cannot be procured in every drug-shop. At Tinghae, the writer visited a ginseng repository, which was a most unpromising and barren-looking place. The commodity is too precious to be displayed at windows or deposited on shelves. Strong boxes behind a rampart of counters alone appear; there it is rigidly kept, disposed in small cases, each of which contains about a drachm weight. A stranger well introduced, or a person of known character, may look at, but not touch it, till he has paid the price. Proverbially it is represented as worth more than its weight in gold, which is confirmed by common practice; for the dealer alluded to asked, as a matter of course, for a bit shown, at the rate of twenty-five dollars an ounce.—*(Extracted from Dr. Wilson's Medical Notes on China.* London, 1846.)

ON THE MOMORDICA-BUCHA,

COMMONLY CALLED

CABACINHO, OR BUCHA OF THE HUNTERS OF PERNAMBUCO.

In the fourth volume of the Pharmaceutical Journal (pp. 360 and 466) are two notices of a cucurbitaceous fruit, called *cabacinha* (little gourd), or *buchinha*, used by the natives of Pernambuco as a substitute for colocynth. Von Martius formerly described it under the name of *Momordica purgans*, but more recently as *Luffa purgans* A notice of the same plant (under the name of *Momordica-bucha*) has appeared in the first number of the fourth volume of the *Jornal da Sociedade Pharmaceutica Lusitana*, published at Lisbon last year, from which we gather the following particulars:—

The plant grows spontaneously in the suburbs of Reciffe (the capital of the province of Pernambuco), and flowers in November and December.

The *root* is branched and fibrous. The *stem* is herbaceous, prostrate, and fistulous; variable in length; of the thickness of a quill, pentagonal and furnished with tendrils. The *leaves* are simple with an elongated petiole, cordiform, with large inferior nervules furnished with rough, regularly disposed hairs. The *tendrils* are opposite to the leaves and branches. The *flowers* small and yellow; the *calyx* monosepalous and five-cleft; the *corolla* monopetalous, regular, and rosaceous; the petals being united together by their extremity, and adherent to the limb of the calyx. The *stamina* in some flowers are syngenesious and indeterminate. The *ovary* is inferior and separated from the flower [corolla?] by a peduncular prolongation. The *fruit* is ovate or oblong, and furnished with spines; when ripe, yellow and dry. It does not dehisce by valves, but discharges its seeds at its apex, by the rupture of the epicarp. The mesocarp consists of a fibrous retiform tissue. The endocarp is compact and forms the walls of three multilocular cavities, each containing in its centre a trophosperm.

By maceration of the fruit in water an infusion is obtained, which has a bitter taste and froths much by shaking. After exposure for some time to the air it undergoes decomposition, and evolves an odour like that of decomposing animal matter. The acetate and nitrate of lead occasion precipitates in it. Sulphate of iron causes a dark green colour and a gelatinous precipitate.

A peculiar substance called *buchanina* has been extracted from the fruit. A specimen of this, and also of the acetate and nitrate of buchanina, as well as of the resin of the fruit, have been sent to the Portuguese Society of Pharmacy by Srs. Paula Teixeira and Joaquim Teixeira Duarte Sampaio of Pernambuco.

The fruit is a drastic purgative. It is frequently used in the form of clyster, prepared by macerating a quarter of a fruit in water for the space of twelve hours, and beating the strained infusion so as to produce a froth, which is separated and the operation repeated twice. This quantity is sufficient for an adult. It operates as a violent drastic; and occasions much pain; and has been advantageously used in old syphilitic cases and in dropsies, where the strength of the patient permitted its employment.

For internal use a tincture is prepared by digesting, for the space of twenty-four or forty-eight hours, four fruits (deprived of seeds) in a bottle of spirit (21°). The dose is three or four ounces daily. This also operates as a violent drastic, but it occasions much sickness.

Another preparation is spoken of. It is a watery extract of the fruit (deprived of the seeds) and made into pills.

Ill effects and even death are said to have resulted from the improper use of the fruit.

FORMATION OF FERROCYANIDE OF POTASSIUM DURING THE PREPARATION OF CARBONATE OF POTASH FROM CRUDE-TARTAR.

BY C. A. INGENOHL.

The author prepared carbonate of potash from recent deeply-coloured crude tartar, using for the lixiviation and evaporation, iron kettles. The salt which he obtained, gave, on the addition of the mixed proto- and persulphate of iron, and some muriatic acid, a precipitate of Prussian blue, and therefore, contained ferrocyanide of potassium. The tartar which was employed contained only a very small portion of iron, but was impure from the presence of yeast and colouring matter, which, by ignition, had yielded some cyanide of potassium. In consequence of the operations on the carbonized mass being conducted in iron vessels, some ferrocyanide of potassium was produced by the action of the cyanide of potassium.

No ferrocyanide of potassium can have been developed during the process of ignition, as it is decomposed by heat. But the cyanide of potassium which is formed, has the power of dissolving iron, protoxide of iron, or sulphuret of iron, and giving rise to the formation of ferrocyanide of potassium, and the evolution either of potash or sulphuret of potassium. Hence, therefore, iron vessels should not be used in the manufacture of carbonate of potash from crude tartar, and this (the tartar) should be as free as possible from yeast.

For chemical use, it is advisable to employ carbonate of potash which has been obtained from purified tartar, and from which the tartrate of lime and chloride of potassium have been removed by water acidulated with muriatic acid.—*Arch. d. Pharm.*, 2 R. Bd. xlii., pp. 34—39.

ON ARTIFICIAL AVENTURINE.

BY MESSRS. FREMY AND CLEMANDOT.

Although the manufacture of coloured glasses has been but recently introduced into France, it has recently been brought to such great perfection, that the gems produced by our manufacturers will, in many cases, bear comparison with those of Bohemia.

There is nevertheless a production of this class which had not as yet been manufactured in France, we allude to the artificial aventurine, which has hitherto only been made in Venice, and the manufacture of which is kept a profound secret. Fine specimens of Venetian aventurine are very scarce, and are sold at as high a price as 200 francs the kilogramme.

We were anxious to discover the mode of making this gem, and of giving the benefit of the discovery to our glass-workers.

After numerous experiments which have been conducted at the glasshouse of Clichy, we have been fortunate enough to obtain results, which, although not brought to the highest degree of perfection, are, notwithstanding, of a nature to induce a relief that in future aventurine will be manufactured in France.

As we wish to supply to our manufacturers, as soon as possible, the deficiency which has existed with reference to this product, we hasten to make known our process for the manufacture of aventurine, hoping that they may bring it to that perfection which practice alone can give it.

The chemical analyses, made principally by MM. Wöhler and Barreswil, have proved that Venetian aventurine is composed of a soft glass holding in suspension metallic and crystallized copper. It appeared then, that aventurine should be obtained by crystallizing copper in melted glass, and having the mixture in such a state that the metallic crystals shall remain disseminated through the vitreous mass.

But knowing the tendency of copper to oxidation, and its fusibility, and appreciating all the circumstances opposed to its crystallization, and the equal diffusion of these crystals through the fused glass, it will be easy to understand the difficulties we had to surmount.

The choice of the composition which, by the action of heat, should afford metallic copper, was not less difficult. We found it necessary to reject those bodies which, in producing copper, would require a temperature either too high or too low; in the first case the metal would become agglomerated before the fusion of the glass; in the second, it would fuse, separate from the glass, and collect at the bottom of the crucible. Neither could we admit of those reactions, which, in producing metallic copper, would give rise to an abundant disengagement of gas, or the deposition of a coloured or insoluble deposit in the glass. A composition had to be found which, at the temperature of the fusion of glass, would produce metallic copper.

After having tried without success the action of different metals on glass coloured by oxide of copper, we have been led to examine the reduction which oxides at the minimum of oxidation are capable of effecting on protoxide of copper, and our attention was principally directed to the action in this way of iron scales.

We have found that, under the influence of heat, iron scales quickly reduce the protoxide of copper to the metallic state, passing itself to the state of peroxide of iron. This reaction appeared well suited to fulfil the end we proposed; it produces pure copper, and has the advantage of forming a metallic oxide, soluble in the glass, and giving it only a slight yellow tint. The formation of a silicate of peroxide of iron is a fortunate circumstance, for, by increasing the density of the glass, this silicate would naturally oppose the deposition of the metallic crystals. We therefore, with confidence tried to produce Venetian aventurine by heating a mixture of glass, protoxide of copper, and iron scales. The experiment confirmed our anticipations.

On heating for twelve hours a mixture of 300 parts of powdered glass, 40 parts of protoxide of copper, and 80 parts of iron scales, and then allowing it to cool very slowly, we obtained a vitreous mass, containing, in abundance, crystals of metallic copper.

The most difficult point in the manufacture of aventurine, namely, the production of a glass containing brilliant crystals of copper, uniformly diffused through the mass, has, therefore, been completely resolved.

The specimens of aventurine which we now present to the Academy, have a certain degree of opacity which destroys the brilliancy of the metallic crystals, and these crystals also are not so large as they should be; but the experiments we are now making lead us to hope that we shall soon have specimens completely satisfactory.

To convince ourselves of the identity of our aventurine with that made at Venice, we have examined them with an excellent microscope, and we find that in both the copper is crystallized in regular octahedrons.—*Journal de Pharmacie.*

ON OIL OF WORMWOOD.

BY M. F. LADLANC.

More than a year ago I undertook the examination of the essential oil of wormwood of commerce, and I intend continuing the examination as soon as I have obtained a sufficient quantity of the oil to enable me to examine its properties more closely. This notice, therefore, is intended only to secure my claim for priority with reference to those facts which I have established.

The essential oil of wormwood, in its unpurified state, is a dark green liquid. It begins to boil at 356° Fahr.; when the boiling point arrives at 392° or 401°, the thermometer remains for some time stationary; the boiling point then rises, the oil becomes thick, more and more coloured, and at last entirely evaporates. There is nothing gained by distilling it in a current of vapour of water, or of carbonic acid.

The decolouration and purification of the oil may be easily effected by rectifying it several times from quick-lime, and collecting the product which is distilled at a temperature between 392° and 401° Fahr. The oil thus purified will have a fixed boiling point at about 401°. Its taste is acrid and burning; its smell penetrating; it is lighter than water, its sp. gr. being .973 at 75° Fahr.

Solutions of the caustic alkalies do not attack it; the *potassa cum calce* attacks it powerfully. The product is much darkened, and one part of it distils unaltered.

Cold sulphuric acid dissolves and colours it; it does not appear to form any ethyl compound. Nitric acid attacks it with violence, and converts it into an uncrystallizable acid resin. The addition of anhydrous phosphoric acid causes colouration and heat, and the separation of the elements of water.

I have made several analyses of the purified oil; these analyses lead to a formula for its composition, which is exactly that of the camphor of laurus camphora. The results are as follows:—

	Experiment. I.	Experiment. II.	Calculation.
Carbon	78.8	79.	78.9
Hydrogen	10.5	10.7	10.5
Oxygen	10.7	10.3	10.6
	100.	100.	100.

The density of its vapour I found to be 5.3; calculation would make it 6., supposing the formula to be, $C_{20} H_{16} O_2$, which is that of camphor; but it appears to undergo a slight change. I think it may be considered that oil of wormwood is isomeric with camphor; its properties should also correspond with those of the group of oils to which camphor belongs.

Distilled several times from anhydrous phosphoric acid, and then treated with potassium, the oil loses the elements of water, and furnishes a hydro-carbon, possessing the smell of Dumas' camphogene obtained by the action of anhydrous phosphoric acid on camphor. The analysis of this product gave:—

	Experiment.	Calculation.
Carbon	88.9	89.6
Hydrogen	10.6	10.4
	99.4	100.

The complete identity of this hydro-carbon with camphogene has yet to be demonstrated, by a comparison of all their physical and chemical properties.

I was anxious to submit the oil of wormwood to an optical examination, to ascertain whether it had any influence on a ray of polarized light, and in such case, to determine whether its power of rotation was different from that of camphor. I found that the oil turned the plane of polarization to the right hand of the observer, in which respect it corresponds with camphor; but the power of rotation is very different from that which camphor possesses.—*Annales de Chimie et de Physique.*

ON THE PRESENCE OF CHLORIDE OF LEAD IN COMMERCIAL MURIATIC ACID.

BY DR. A. VOGEL, JUN.

The usual impurities hitherto detected in muriatic acid are for the most part derived from the sulphuric acid, which is used for decomposing the common salt. They consist of sulphurous, sulphuric, and nitrous acids; chlorine and chlorides of arsenic, tin, iron, and even selenium.

Dr. Vogel found that a commercial muriatic acid contained none of the above-mentioned impurities, with the exception of slight traces of chlorine and iron, but that it always gave a black precipitate with sulphuretted hydrogen, which arose from the presence of a rather large portion of chloride of lead. When diluted with water, small crystals of chloride of lead were gradually formed; for this substance is more soluble in concentrated than in diluted acid. This presence of chloride of lead (which amounts to about one per cent. of the acid) is to be ascribed to the circumstance of the common salt having been decomposed and the acid distilled in leaden vessels, which are in use in several manufactories.—*Buchner's Repert.*, 2 R., Bd. xxxvii, pp. 313, 315.

ADULTERATION OF IODINE.

Herberger observes, that in consequence of the high price of iodine, this substance is very frequently adulterated. Thus in one specimen he found radiated black sulphuret of antimony. Still more deceptive is the adulteration with artificial plumbago. This, however, is easily discovered, by volatilizing the iodine at a low heat, and afterwards applying a strong degree of heat with admission of air. In one case, he found 51 per cent. of plumbago. —*Jahrb. f. Prakt. Pharm.*, xi. p. 35.

THE COMPARATIVE VALUE OF MALT AND BARLEY AS FOOD FOR CATTLE.

We have received a copy of "*Reports to Her Majesty's Government with respect to feeding of Cattle with Malt*," by Thomas Thomson, M.D., Prof. Chem. University of Glasgow, and R. D. Thomson, M.D., Teacher of Practical Chemistry in the same University.—Want of space obliges us to defer our analysis of these documents.

TO CORRESPONDENTS.

"**Mercury**."—(1.) Tinct. Iodinii, P. E.—(2.) We are not aware that any means are used for hastening the deposit of mucilage from essence of lemon.—(3.) In the mixture containing iodide of iron and infusion of columbo, the blue colour arises from the presence of a portion of free iodine acting on the starch of the columbo. In the case of several vegetable infusions, this blue colour disappears after a short time, being, as it is supposed, destroyed by some other principle in the infusion.—(4.) Apply to any bookseller.

W. S. Y.—(1.) Sulphate of bebeerin is prepared from the bebeeru or greenheart-tree, by a process similar to that by which sulphate of quinine is obtained from bark.—(2.) The sp. gr. of the nitric acid used in making sp. ætheris nit. should be 1.50. The distillation should be conducted rapidly, with active ebullition.—(3.) *Pure* oil of amber should be used in making artificial musk.—(4.) Sesquioxide or teroxide of antimony may be obtained by adding the liquid chloride of antimony to water, collecting the precipitate, and washing it with solution of carbonate of soda. The other compounds of antimony and oxygen are antimonious acid and antimonic acid. The former exists in antimonial powder, and is obtained by calcining antimony at a high temperature, the presence of the animal matter (horn shavings) facilitating the process. Antimonic acid results from the action of nitric acid on antimony.

"**Francisco**."—We regret that we misunderstood the question respecting ung. hyd. nit. dil.; see vol. iv. p. 450. We are unable to account for the ointment when diluted being of a bad *consistence*, not having observed this defect, although we have observed that it always changes colour.

"**Bolus**."—The sample of P. cantharid. is about as finely powdered as we usually see it.

M. P. S. (Bristol).—In the establishment of a society it is difficult at first to prevent a few "black sheep" obtaining admission; but the expulsion of a member is a serious step, and could only be done on good grounds being officially laid before the Council.

"JALAPUS."—Pil. aloes dilut.; see vol i. p. 602.

X. S. R. R.—(1.) We are not aware that hydrochloric acid will stain white marble.—(2.) Griffin's spirit lamp furnace is simply a stand for supporting anything over a spirit lamp, and at the same time confining the heat. —(3.) The presence of sulphate of magnesia in oxalic acid may be detected, and the quantity estimated by heating the specimen to dull redness, when the oxalic acid will be decomposed and driven off, and the sulphate of magnesia will remain, and may be weighed and tested.

"LAMED," M. P. S.—(1.) Hydrated peroxide of iron may be obtained by adding ammonia to solution of persulphate, or perchloride of iron. It should be preserved in a bottle covered with water, and should be given in doses of ʒss, ℥j, or more according to the quantity of arsenic supposed to have been taken.—(2.) The method described in the Pharmacopœia.

"ALPHA."—℔ss, according to the Pharmacopœia, means ℥vj. It formerly denoted ℥viij, and is still sometimes used in this sense.

T. J. H.—The magnesia of the Pharmacopœia, is not so dense as that sold as *heavy* magnesia. The preparations used in dispensing should be as ordered in the Pharmacopœia.

B.—We know of no authorized formula for decoction of Yarrow.

G. H. G.—According to a table published in Christison's *Dispensatory*, the peel of 100 oranges yields ℥iiss of volatile oil; the peel of 100 lemons, ℥ij of volatile oil; 100℔s of cloves, from 100 to 150 ounces of oil; and 100℔s of Chamomiles, from ℥j to ℥v of oil.

"HUMILIS."—The pound avoirdupois is equal to 7,000 grains; the pound, Apothecaries' weight, is equal to 5,760 grains.

R. S., M. P. S.—(1.) The error is obvious, but of no importance.—(2.) The first six numbers of the Journal may be obtained of the Publisher, Mr. Churchill, through any bookseller.—(3.) No.

"INCOGNITUS."—(1.) The precipitate formed on adding diacetate of lead to tincture of kino, consists of oxide of lead with the tannin and other vegetable matter contained in the tincture.—(2.) Maw-seeds are the seeds of the common poppy.

H. H. (A Subscriber).—The best test for the presence of sugar in urine is the hydrated protoxide of copper, obtained by adding excess of liquor potassæ to solution of sulphate of copper.

"MODESTAS."—The instructions in the Pharmacopœia are explicit and sufficient.

J. C. T. B.—(1.) Yes, by Rennie.—(2.) *Gray's Supplement* is out of print.

M. P. S.—Salt of lemons or chloride of lime.

"AN ASSOCIATE."—Teinture de cantharides.—*Paris Codex*.

℞ Cantharides en poudre deux onces	64
Alcohol à 21° Cart (56 cent.) une livre	500

Faites macérer pendant quinze jours : passez avec expression : filtrez.

"A PHARMACEUTICAL ASSISTANT."—(1.) Sulphuret of silver is insoluble. —(2.) See vol. v. p. 412.—(3.) *Vinum ferri* was formerly made by adding iron filings to sherry wine.

"AN OCCASIONAL READER," F. Z., W., "MULTUS," T. W. A., F. C., C. T., are alarmed because we omitted to state that there is in the proposed Bill, a clause providing for the case of those who were Associates before the date of the Charter. We regret that this omission on our part has occasioned uneasiness. At the same time, we advise the parties concerned, not to avail themselves of any exemption from examination thus afforded; but voluntarily to come forward and pass.

MR. RAW (Richmond) objects to any exception being made in the Bill in favour of medical men, and the vendors of simple drugs, &c., observing—

"The medical man is distinctly educated from the Chemist, and if he wishes to compound drugs for retail sale, let him submit to the examination necessary.

"With regard to the exemption of vendors of simple and uncompounded drugs, and the preparers of horse and cattle medicines, you leave the country Chemist more in the power of the Grocer and the quack than he was before.

"If any man wish to be a vendor of drugs, let him qualify as such. The examination is to be open to all, and let that be the test.

"The Council can know but little of the routine of the country trade of a Chemist, when they attempt to legalize what we are actually struggling against."

"A MEMBER FROM THE FIRST" approves of the general principles of the Bill, but thinks "petty shopkeepers" should be restricted from selling paregoric, syrup of poppies, and other medicines of that class.

F. M. R. wishes some means could be adopted for excluding from the general registration as Chemists, such persons as possess no qualification, except probably an old work on domestic medicine, and a few drugs and bottles with the respectable words "Chemist and Druggist" over their doors: observing that this class of persons, though numerous, are at present insignificant; but if registered as regular Chemists, they would become more important, being "made respectable by Act of Parliament."

Advertisements to Mr. CHURCHILL, Princes Street, Soho.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Other Communications to THE EDITOR, 338, Oxford Street, before the 20th of the month.

TO THE BINDER.

The Title-page and Table of Contents to be placed at the beginning, the Index at the end, of the volume.

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